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ORCHIDS:

Their Culture and Management.

ORCHIDS:

Their Culture and Management.

By W. WATSON

(Curator, Royal Botanic Gardens, Kew).

New Edition,

Revised throughout and Greatly Enlarged.

CONTAINS

Full Descriptions of all Species and Varieties
that are in General Cultivation,
A List of Hybrids and their Recorded Parentage,
and
Detailed Cultural Directions.

By H. J. CHAPMAN

(Member of the Orchid and Scientific Committees of the Royal Horticultural Society, and Gardener and Orchid Grower to Mr. Norman C. Cookson, Oakwood, Wylam-on-Tyne).

Illustrated with 20 Coloured Plates, of which 18 are new, having been prepared expressly for this Edition from Water-colour Drawings by Miss G. E. Upcott Gill; and a large number of Engravings, of which the majority are from Photographs taken by Mr. H. J. Chapman, and published now for the first time.

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PUBLISHER'S PREFACE.

A NEW Edition of this work having been called for, and the official position of the original author precluding that gentleman from undertaking the heavy work of the extensive alterations and additions which time had rendered necessary, the task was placed in the hands of Mr. H. J. CHAPMAN, who is admittedly one of the most able Orchid Growers and Hybridists in the country. How he has acquitted himself of the duty this volume is a testimony. It is believed that "Orchids: their Culture and Management," as now presented to the public, is at once the fullest and the most practical work on the subject ever issued.

A great many new illustrations have been added, including a number of coloured plates, which latter, whilst at least not less successful than anything of the kind yet attempted, do not entirely reproduce the full beauty of their subjects, chiefly by reason of the great reduction in size that was rendered necessary by the exigencies of an octavo volume.

EDITOR'S PREFACE.

LITTLE by way of Preface is required from an Editorial standpoint, as the scope of this work is sufficiently well known. It may, however, be as well to state that the generic and specific limitation is practically that of Nicholson's "Dictionary of Gardening," and this in its turn reflects Kew. In a few isolated cases the Editor has found himself unable to accept either of these recognised authorities, and has given a reason therefor; but he trusts that in saying so he will not be accused of attempting to play the part of Sir Oracle. There have been one or two departures in style from the old work, one being the allocation of sponsors to the genera and species described. These additional features, it is hoped, will be of service to those who regard the book alike from a botanical and a horticultural standpoint; while the generic derivations have also been included.

Necessarily in the production of such a volume many points arise that are the better for a second opinion. The Editor has frequently taken this, and would like here to acknowledge his indebtedness to: Mr. W. D. DRURY, for aid and advice in many difficulties; Mr. R. I. MEASURES, who at the commencement of the revision of the work placed at the Editor's disposal the use of his extensive library, and also gave permission for the illustration of plants in his famous collection; Mr. N. C. COOKSON, for permission to photograph flowers and plants for reproduction, and for much kindly advice on other matter contained in the work; those who have lent their aid in the compiling of the hybrid lists; and the Horticultural Press for abstracts and records which otherwise could only be obtained at the cost of immense labour and research in works not readily accessible to the multitude.

REFERENCES TO PLANT ILLUSTRATIONS.

ALTHOUGH one of the aims of those responsible for this work has been to give as many illustrations as possible, yet to illustrate even a tithe of the species and varieties described would be out of the question. What, therefore, has been done, when a plant is not figured in the text, is to refer the reader to an illustration in some standard publication, giving preference to those of the "Botanical Magazine." The names of such publications have been abbreviated with a view to economising space in the body of the work; but below they are set out in full.

Belg. Hort. ..	La Belgique Horticole. Ghent, 1850-85. 8vo.
B. M.	Botanical Magazine. London, 1787, &c. 8vo.
Batem. Monog.	Bateman (James). A Monograph of Odontoglossum. London, 1874. Fol.
B. R.	Botanical Register. London, 1815-47. 33 vols. 8vo.
F. d. S.	La Flore des Serres et des Jardins de l'Europe. Gand., 1845-83. 23 vols. 8vo.
F. M.	Floral Magazine. London, 1861-71. 8vo. Series II., 1872-81. 4to.
G. C.	The Gardeners' Chronicle and Agricultural Gazette. London, 1841-65. 4to. New Series, 1866-86. 4to. Series III., 1887, &c. 4to.
G.	The Garden. London, 1871, &c. 4to.
G. & F.	Garden and Forest. New York, 1888, &c. 4to.
I. H.	L'Illustration Horticole. Series I. to IV. Gand., 1850-86. 33 vols. 8vo. Series V., 1887, &c. 4to.
J. H.	Journal of Horticulture and Cottage Gardener. Conducted by Dr. Robert Hogg. London, 1849, &c. 4to.
L.	Linden (L.) and Rodigas (É.). Lindenia: Iconographie des Orchidées. Gand., 1885, &c. Fol.
L. B. C.	Loddiges (C). Botanical Cabinet. London, 1812-33. 20 vols. 4to.
L. S. O.	Lindley (J.) Sertum Orchidaceum. London, 1838. Fol.
O. R.	Orchid Review. London.
P. F. G.	Lindley (J.) and Paxton (J). Flower Garden. London, 1851-53. 3 vols. 4to.
P. M. B.	Paxton (J.). Magazine of Botany. London, 1834-49. 16 vols. 8vo.
R.	Sander (Fredk.). Reichenbachia. London, 1886, &c. Fol.
R. G.	Regel (E.). Gartenflora. Erlangen, 1852, &c. 8vo.
R. X. O. ..	Reichenbach (*fils.*), (H. G.). Xenia Orchidacea. Leipzig, 1858. 4to.
S. B. F. G. ..	Sweet (R.). British Flower Garden. London, 1823-29. 3 vols. 8vo. Series II., 1831-38. 4 vols. 8vo.
W. & F.	Woods and Forests. London, 1883-84. 1 vol. 4to.
W. O. A. ..	Warner (R.) and Williams (B. S.). The Orchid Album. London, 1882, &c. 4to.
W. S. O.	Warner (R.). Select Orchidaceous Plants. London. Series I., 1862-65. Fol. Series II., 1865-75. Fol.
X.	*See* R. X. O.
Xenia	*See* R. X. O.

LIST OF COLOURED PLATES.

	FACING PAGE
VANDA KIMBALLIANA	*Frontispiece*
CALANTHES KENNETH AND TRIUMPHANS . . .	76
CYPRIPEDIUM MISS FANNY WILSON	189
CYPRIPEDIUM VENUS	142
DENDROBIUM AINSWORTHII INTERTEXTUM . . .	115
DENDROBIUM FORMOSUM	352
DENDROBIUM WARDIANUM	223
DENDROBIUMS DULCE, KENNETH, AND CASSIOPE.	523
EPIPHRONITIS VEITCHII	248
LÆLIO-CATTLEYA CAPPEI	93
LÆLIO-CATTLEYA FANNY LEON	285
MILTONIA BLEUANA	337
ODONTOGLOSSUM CORONARIUM MINIATUM . . .	24
ODONTOGLOSSUMS WILCKEANUM AND EXCELLENS	401
PHALÆNOPSIS SCHILLERIANA AND P. S. VESTALIS .	427
SACCOLABIUM GIGANTEUM	449
SELENIPEDIUM NITIDISSIMUM	463
SOPHRONITIS GRANDIFLORA	538
VANDA CÆRULEA WELLESLEY VAR.	499
VANDA TRICOLOR	51

ORCHIDS

AND THEIR MANAGEMENT.

INTRODUCTORY.

IN no branch of Horticulture has more rapid progress been made during the last half-century than in the cultivation of Orchids. With the facilitated steamship passages of the present day, species that a few years ago were comparatively scarce, and represented by only a few plants in cultivation, are in many cases annually imported by thousands, and are translated from their native habitats in as many days as it formerly took months. Moreover, they are brought practically to the doors of our glass-houses at a cost of fewer shillings than not many years ago would have been represented by pounds. This increased facility, combined with better arranged houses, and the enlightenment of the grower especially in the art of hybridisation, has to a great extent been responsible for the increased measure of popularity Orchids now enjoy. For many years this advancement was principally confined to enthusiastic amateur cultivators, and it is to the liberal support of these gentlemen that we are most indebted. Of late years, however, many of the most popular and useful species have been extensively grown in nurseries to supply the cut-flower market. As an illustration of the extent of the industry, it may be cited that one firm alone has no less than 100,000 Odontoglossums under cultivation. As these were mostly

procured in an imported condition, many varieties of sterling merit have already appeared among them. In the future it is confidently expected that even greater developments may be looked for. Already English growers have succeeded in supplying a section of cut-flowers that heretofore were almost entirely produced on the Continent.

Of the influences that in the past have tended to keep the more general cultivation of Orchids in the background is the utterly erroneous idea that the initial expense is too great to be undertaken by anyone but millionaires. Another has been the popular notion that even when the plants have been procured they require such particular housing and treatment that a man with a special knowledge of their culture is indispensable. It is easy to refute the first of these objections by simply stating the fact that a selection of plants of the very finest species and hybrids may be procured for a sum equivalent to what would have to be expended on the purchase of a collection of Carnations, Pelargoniums, or similar stove or greenhouse subjects.

As to the special houses, this is equally fallacious, for wherever exists the accommodation for the culture of the usual stove and greenhouse plants, there may Orchids be successfully grown. With regard to the specialist gardener, even this individual exists rather on paper than actually. Any man with common sense can grow Orchids if he is a successful cultivator of stove and greenhouse plants. His sense of observation, with energy, should be sufficient to enable him to surmount all difficulties. There is a decided line to be drawn between a useful and an interesting collection of Orchids and becoming the possessor of a vast collection and making the plants a speciality. In the latter case a thoroughly trained and experienced man is absolutely essential.

In the cultural notes that follow, the aim of the writer has been to set forth the conditions under which he has obtained the best results; but it must be clearly borne in mind that there are no hard-and-fast lines to be observed in Orchid culture any more than there are in connection with other plants. In many instances (some of which are cited further on) even a change of

position in the same house has produced remarkable results. This is pointed out in order that cultivators may endeavour to ascertain for themselves suitable conditions of culture where those here advised do not happen to meet individual cases.

Houses.

It has been previously stated that the ordinary greenhouse and plant stove will generally suffice for the requirements of the various species of cool and tropical Orchids; but where it is intended to build a house with a view to cultivating particular species or families of Orchids a few hints may not be out of place. A few years ago it was a common practice with Orchid specialists to have a wide space between the laps of the glass, with the idea of inducing a free circulation of air. There can be no question that it did allow a free circulation of air, especially on cold, frosty, or windy nights. To retain anything like the normal temperature required, excessive heat in the hot-water pipes became a necessity, thus acting detrimentally on the plants subjected to such treatment. This is cited to illustrate that while it is desirable to have at command every facility for affording fresh air, the appliances should always be absolutely and completely under control. The lower ventilators should be ample, and be placed in such a position that the fresh air admitted should pass over the hot-water pipes before coming in contact with the plants. The roof ventilators should be sufficiently large, and so constructed that they are easily lifted when necessary.

It is always advisable to have plenty of piping, more particularly in the warmest divisions. Side-lights should be dispensed with where possible, and especially in cold, exposed positions. Side-lights are really of little advantage, except to cause an excessive drying of the potting compost during bright, warm weather, while they are of but slight protection against cold in winter. Ordinary brick walls provide a more even temperature, and better assist in retaining moisture about the plants and house.

The stages should be of concrete or slate covered with some moisture-retaining substance, such as coke breeze.

Houses.

Wood trellis may be placed over this, but every care must be taken against the use of material in the staging that may be favourable to the development of fungus spores. Full provision should also be made for the storage of all rain water procurable.

Shading.

The lath roller blinds that have come into extensive use of late are undoubtedly most suitable for Cattleyas, Cypripediums, Odontoglossums, &c.; but in bright districts it is necessary to provide some additional shading on the glass during the summer months. These blinds should be raised by means of runners about 1ft. from the glass at the bottom; this permits a free circulation of air between the blinds and the glass, with the result that inside the house a cooler condition may be maintained than would otherwise be possible. These blinds are also useful during cold, windy weather in winter, thus obviating the necessity for excessive fire heat. For Phalænopsis, Vandas, &c., the tiffany blinds are indispensable.

Procuring the Plants.

The various species of both the Old and the New World are usually imported annually in large quantities, and are sold by the nurserymen making Orchids a speciality, or are distributed by auction at the usual weekly sales in London or elsewhere. Many of the species are imported in such quantities that they may be obtained for quite an insignificant sum. The advantage of procuring imported plants when they arrive in good condition is that it is impossible for even an expert to determine the particular characteristics of such plants until they have been induced to flower. Therefore the small purchaser has an equal chance with the large one of securing a kind that may be of priceless value. There is another advantage that should not be overlooked in the case of imported plants—they retain their vigour for a few years (and this is rarely the case with plants that have been in cultivation for any length of time), and they are thus far more easily managed.

Procuring the Plants.

In potting up imported Orchids, the pots, pans, or baskets set apart for their reception should be just sufficiently large to contain the plants comfortably. Ample drainage should always be afforded, and only a small portion of potting compost need be placed on the surface.

Watering.

To be able at all seasons to afford the requisite quantity of water at the roots is one of the chief difficulties in the successful cultivation of Orchids. During the growing season, when plenty of moisture is necessary, there is little difficulty in supplying their requirements; but immediately growth is complete, as well as through the resting season, it is most difficult to supply just sufficient to keep the pseudo-bulbs and maintain the leaves in a plump state and yet not enough to excite premature growth. Water should always be furnished at a slightly higher temperature than the mean of the house. Rain water, if possible, should be employed. If hard water is used, it causes the sphagnum to die, and the decomposition thus set up spreads quickly to the remaining portion of the potting compost, causing the whole to become sour and unsuitable, and necessitating repotting of the plants.

Damping.

"Damping-down," or the throwing of water about the floors, staging, and walls, is indispensable in Orchid culture. By such means is obtained the necessary moist atmosphere. No hard-and-fast rule can be laid down for this operation. It should always be governed by the temperature of the house. Excessive moisture during the prevalence of cold, dull weather, with low conditions of temperature, induces the condition known as "Black Spot," that renders the plants so unsightly. The higher the temperature, the greater are the necessities for atmospheric moisture. It is never safe to damp-down the houses until the temperature has reached the normal. When done later in the day it should be sufficiently

Damping.

early to permit of the moisture becoming distilled before the cool evening temperatures set in.

Ventilating.

From time to time much has been said about the provision of a free circulation of air about the plants. It it all very well to retain a sweet and healthy state of the atmosphere, but there is limit even to this, and generally speaking there is no detail in Orchid culture that needs more thoughtful attention. The changeable conditions of our climate are responsible for considerable fluctuations of temperature; so that it is most important that these sudden changes should be carefully guarded against. Where the sun has been shining brightly, but not sufficient to necessitate lowering the roof blinds, and the temperature has been maintained at the desired degree by the use of the ventilators, then the conditions are such as to call for the lowering of the blinds. Unless the ventilators are closed sufficiently to counteract the effect of more shade, the result is a sudden drop in the temperature inside the house. It is changes such as these that affect the well-being of the plants, and therefore they have to be guarded against. Preferably the cultivator should make use of the lower ventilators. The reason for this is that as soon as the roof ventilators are opened, an outlet is formed for the atmospheric moisture, which it is absolutely necessary to retain during the hottest weather, and at the season when the plants are in the most active state of growth. Direct draughts from the ventilators are very injurious.

Stoking.

This is an art that few young gardeners acquire, while the majority seem to treat it as but a minor detail, instead of being one of the most important in connection with plant-growing under glass. To be able to provide and maintain the desired temperature with the least possible fluctuation is not a matter to be lightly regarded, nor is it so easy of accomplishment as some would have us believe. To dispense with as much fire heat as possible,

Stoking.

and to manage the fires in such a manner that there be little possibility of checks to the plants entrusted to one's charge, is well worth the consideration of every practical Orchid-grower.

Temperatures.

It is proposed to divide the temperatures thus:—*Stove or East Indian House:* Summer temperature 75deg., winter 65deg. *Warm Intermediate:* Summer temperature 65deg., winter 58deg. *Cool Intermediate:* Summer temperature 60deg., winter 50deg. to 55deg. *Cool House:* Summer temperature 55deg., winter 50deg. The above are night temperatures, and from 5deg. to 10deg. or even more should be allowed for day temperatures with sun heat. Three divisions will be sufficient to accommodate the whole of the Orchid family needing the protection of glass; but where the fourth can be provided it will found advantageous.

Imported Orchids.

Orchid importing now is a totally different thing from what it was a few years ago. Then it was practically left to a few of the most energetic nurserymen who were prepared to go to considerable expense in their endeavours to introduce a sufficient number of plants to supply the demand, and if possible to procure new kinds. It is to these that we are largely indebted for the development of Orchid culture from its infancy. Indebted too, are we to enthusiastic collectors of days gone by, for not only had they to combat climatic ills, but also the native uncivilised tribes that they had to meet in pursuit of their calling. The work of the few has now grown into a recognised business, and there now exist agents in the various parts of the world who are prepared to despatch any number of plants to wherever they may be required. Most of these come to our prominent Orchid-nurserymen still; but there are frequently importations arriving direct, and these are sold by auction in various parts of this country, and such become generally distributed in gardens. Amateur collectors frequently

Imported Orchids.

exhibit considerable energy in the importation of Orchids; but unless those collecting have a knowledge of the species, efforts in this direction usually end unsatisfactorily. The writer has frequently been called upon for advice after such importations have arrived, and no more undesirable position can a man be placed in than to be compelled to lay bare the fact that the plants collected with so much labour, transferred to the coast, carefully packed in cases, diligently attended on the homeward route, and for which heavy freightage has been paid, are not worth so much as the boxes that contain them. Yet such is the general result of amateur endeavours in this direction.

The treatment of imported plants when they arrive has now become so generally understood that only a few hints are necessary. In the first place all warm-growing kinds should not be immediately transferred to the hot division as soon as received. By gradually bringing the plants under their intended growing conditions they generally regain their normal state with little apparent ill-effect. The receptacles for the plants should not be too large, and ample drainage should be provided.

The cool-growing sections may be laid out on beds of ashes or some other moisture-retaining material. Here they quickly regain their normal conditions, commence to emit new roots, and produce young growth. They may then be transferred to small receptacles containing as little material as possible.

Water must be sparingly and carefully afforded until the growth gets well away from the base, when more liberal treatment may be given. All overhanging pseudo-bulbs should be secured, and the plants made as neat in appearance as possible.

General Culture.

The requirements of the various species often differ so materially that it has been decided to deal with the actual culture of each family as it is reached, and before referring in detail to the species and varieties best known to cultivation.

Orchids as Town Plants.

The atmospheric surroundings of London and other large towns and cities in smoky manufacturing districts are annually becoming more detrimental to plant-life generally. In fact, it has become a question of some importance as to what species of plants do best under such unfavourable conditions. The gaudy-foliaged stove plants lose their beauty with the first autumn fogs. The hardiest of the greenhouse Ferns become burnt up, and present a rusty appearance. The usual greenhouse occupants are altogether unable to withstand the town winters; while even such sturdy, hard-wooded subjects as the Indian Azaleas lose their leaves, and when the flowers expand in the spring they appear as if affixed to bare pieces of wood. Such being the case, it will probably appear strange that the writer should advocate Orchids as being suitable subjects for town culture. Perhaps it will surprise many to know that within about a mile of Charing Cross, and on low-lying ground in one of the most densely-populated districts, surrounded by factories and gas-works, and within easy distance of the fog-laden Thames, is to be found one of the most prominent Orchid collections in this country. For upwards of nine years the writer had the care and management of this collection, which is not only numerically large, but thoroughly representative, and includes quite a number of those miniature Orchids that are of botanical interest. Certainly Orchids thrive far more satisfactorily than any of the ordinary kinds of plants generally found in greenhouses. Of course the fogs in winter do damage to the plants, but generally they do not suffer to the same extent as do other plants grown under similar conditions.

The accompanying Illustration (Fig. 1) of Orchids grown as Town Plants, and for which we are indebted to Mr. R. I. Measures, of Camberwell, will show what may be done under the most unfavourable surroundings possible.

There are certain species, such as the deciduous Calanthes, that produce their flowers through November and December, and these it is well-nigh useless to attempt to cultivate with the possibility of seeing the

Orchids as Town Plants.

flowers expand. They are so delicate in texture that they are damaged by the slightest fog, while obstruction of the light has the effect of so altering the coloured kinds that they are with difficulty recognised, and do not afford satisfaction to either grower or owner.

On the other hand, the cool-growing and winter-flowering sections of the genus *Cypripedium* are rarely damaged to any extent, and when once opened the flowers last in perfection for many weeks, and yield a goodly display at Christmas and after. The majority of Orchids being spring- and summer-flowering subjects, there is little difficulty at those seasons in supplying the necessary conditions for their successful culture. Those interested in this particular phase of the subject will find some detailed information under **Cypripedium.**

Insect and other Pests.

By far the greatest number of pests infesting Orchids belong to the class *Insecta*, or Insects. These include Cockroaches, Thrips, Mealy Bug, Scale, and *Aphides* (Greenfly and their allies), &c. Thrips being very minute, may escape attention for a time; but the foliage soon gives evidence of their attacks in the young leaves, which discolour owing to the constant sucking of the parts by the insects. Cockroaches are more destructive to Orchids than is commonly supposed. The fact is that being nocturnal their depredations are not as readily traced. They attack the flowers, and if not trapped or poisoned, soon disfigure a large number of promising blossoms. Nor is it only the Common Cockroach that the Orchid-grower has to fear. Of late years many exotic species have been introduced into our plant-houses with importations from abroad.

The above constitute what may be termed general insects likely to be found in any plant-house; there are, however, one or two other insects to be noticed hereafter that confine their attention to certain genera of Orchids—the Dendrobium Beetle (*Xyleborus perforans*) and the Cattleya Fly (*Isosoma orchidearum*).

With the exception of Scale and Mealy Bug, the Cockroaches, and the beetle just named, all the other



FIG. 1. ORCHIDS AS TOWN PLANTS—CATTLEYAS AND DENDROBIUMS IN FLOWER.

Insect and other Pests.

insects may be kept under by means of fumigations of XL All, which, except in one or two isolated cases (*Masdevallia tovarensis* is the only Orchid whose flowers we have noted seriously affected, and the foliage of Disas and *Cœlogyne cristata*), does not affect the colours of the flowers. For Scale and Mealy Bug, fumigations are useless; but the XL Wash is very effective. Soft soap solutions (1oz. to the gallon of water) is also a good insecticide to employ against Scale, and moreover a safe one if the quantity suggested is first boiled in about one-fourth the quantity of water given and the remaining water afterwards added. Where the plants are not numerous, both Scale and Mealy Bug may be destroyed by touching them with a brush that has been dipped in methylated spirit.

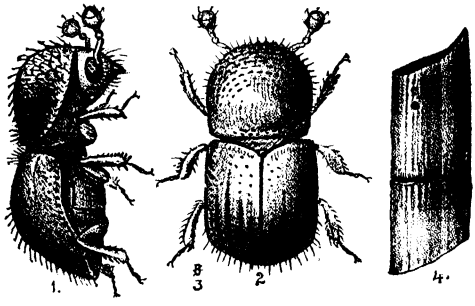
Cockroaches must either be trapped, or better still, poisoned by means of phosphorus paste. This, however, needs to be carefully employed, or domestic animals may be accidentally poisoned. The poisoned "baits" should be collected each morning, and burned, together with any Cockroaches found.

With regard to the Cattleya Fly a more extended notice is necessary, as this pest is not at all well known. The insect deposits her eggs in the eye of the young growth when the plant is in a dormant state. As a consequence, the growth does not advance much above 1in., swells in the centre, and generally exhibits a stunted appearance. If this growth is cut off at the base and split open, there will be disclosed from three to seven yellowish maggot-like creatures. After eating a large hole in the young growth, they become pupæ, and eventually emerge as perfect flies. They should be destroyed as soon as seen. Fumigation with a vaporising insecticide will effectually settle them before they have time to deposit their eggs. The roots, too, not infrequently, are pierced by the insects, and a warty growth results. The grubs should be picked out with a stout needle.

The Dendrobium Beetle is a destructive insect from the tropics that flourishes in Orchid-houses, where it is especially partial to *Dendrobium Phalænopsis*. Both Beetle and grub are destructive. The perfect insect (Fig. 2) is rather more than $\frac{1}{12}$in. in length, and chestnut-brown

Insect and other Pests.

in colour. As the specific name suggests, it perforates the stems (Fig. 2), and, once inside, tunnels in various directions, causing the plant attacked to have an unhealthy look. The grub (Fig. 3) is white and footless. Plants exhibiting signs of decay, and whose stems are found to be perforated in the way shown in the portion of plant illustrated, should have such portions removed and burned. The check received will be nothing to the damage that would ultimately occur were the insects allowed free play. In bad attacks Dendrobiums are sometimes killed. This Beetle does not feed exclusively upon



By permission of the Board of Agriculture.

FIG. 2. DENDROBIUM BEETLE (*Xyleborus perforans*).

1 and 2, Beetle highly magnified; 3, Insect, natural size; 4, Infested stem, with hole made by Beetle.



FIG. 3. GRUB OF DENDROBIUM BEETLE IN ORCHID STEM.

Orchids; in the sugar-growing countries it is destructive to the canes.

Outside the class *Insecta* we have the Woodlice, which are extremely partial to the young roots of Orchids. Like the Cockroaches they are nocturnal, and like them, too, they are best destroyed by means of phosphorus paste. The Red Spider may be fought by fumigations of XL All insecticide, and by sponging the foliage.

Slugs and Snails are at times troublesome, and especially the Garlic-scented Snail that is so commonly introduced with the sphagnum. These pests will gnaw through the flowers should they escape the vigilant eye of the gardener,

Insect and other Pests.

and should he not have taken means to prevent them from reaching the growing plants. This may be effectually done by placing the plant upon an inverted flower-pot and standing this in a saucer with water all round. This also will serve to protect the plants from Cockroaches and Woodlice.

"Spot" in Orchids is a disfiguring disease, doubtless of fungoid origin, and certain conditions of the house tend to promote it. In winter it is oftener met with than at other times, and especially when there is a great deal of moisture accompanied by a stagnant atmosphere. The remedy therefore is obvious.

STRUCTURE AND OTHER PECULIARITIES.

Before entering upon the description of those members of the Orchid family which have been selected for special consideration as garden plants, it will be well to give a slight sketch of the Order, and to glance at those points of structure by which it is distinguished. There is probably no Order in the whole Vegetable Kingdom the limits of which are more clearly defined; and there is certainly none which, within those limits, exhibits more variety than the one now before us in the colour, shape, or odour of its blossoms. It is in the structure of the flowers, too, that we find the features that specially characterise the Order.

It is not proposed to go into a botanical disquisition upon the structure of an Orchidaceous flower; but there are one or two terms connected with it that are of constant occurrence, and may therefore be fitly explained here. In an ordinary regular flower, such as the Buttercup, we have, besides the stamens and pistils, two outer rows—one of *petals*, forming the *corolla*, and one of *sepals*, forming the *calyx*. In dicotyledonous plants, the calyx, speaking generally, is green, and the corolla coloured, so that they are easily distinguishable; but in such monocotyledons as the Hyacinth or the Tulip, the petals and sepals are almost or quite indistinguishable, and the whole flower goes by the name of a *perianth*, the three outer segments being,

Structure and other Peculiarities.

strictly speaking, sepals, and the three inner, petals. In *Orchideæ* there is usually a marked irregularity in the shape of the flower, the nature of which will be made clear by the accompanying Illustration (Fig. 4). We have, outside, a row of three sepals (*s*); then come three petals (*p*), two of which usually more or less resemble the sepals

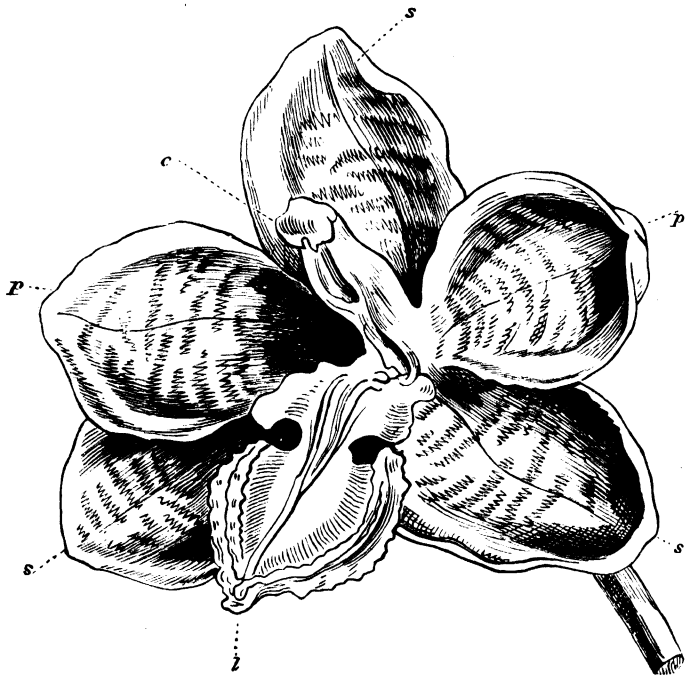


FIG. 4. FLOWER OF ARACHNANTHE CATHCARTII
(nat. size).

in shape and colouring; while the third petal (as we may consider it for practical purposes), which usually differs considerably in size, colour, and form, and is the lowest in the flower, is known as the *labellum*, or lip (*l*). This *labellum* is sometimes prolonged backwards at the base into a tail, or spur, which usually contains honey; in the wonderful *Angræcum sesquipedale* of Madagascar this spur

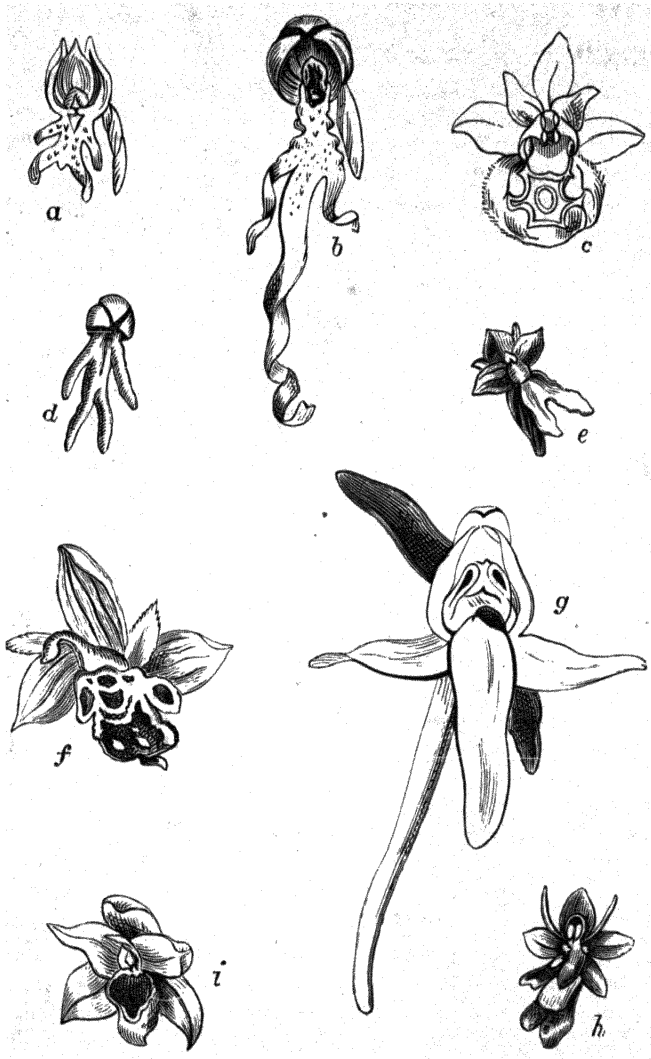


FIG. 5. GROUP OF FLOWERS OF BRITISH ORCHIDS

(nat. size).

a, *Orchis militaris*.
b, *Orchis hircina* (Lizard Orchis).
c, *Ophrys arachnites*.
d, *Aceras anthropophora* (Man Orchis).
e, *Listera ovata* (Twayblade).
f, *Ophrys apifera* (Bee Orchis).
g, *Habenaria bifolia chlorantha*.
h, *Ophrys aranifera* (Spider Orchis).
i, *Epipactis palustris*.

Structure and other Peculiarities.

is more than 1ft. in length. We shall see, as we proceed, something of the wonderful variety in form of this characteristic feature of an Orchid flower; and the accompanying group of the blossoms of a few of our British Orchids (Fig. 5) will give some notion of its extent in the natives of our own woods, commons, downs, marshes, and fields. The other remarkable point in the flower of an Orchid is the *column* (*c*). In most blossoms the stamens and pistils are separate organs; but in the Orchids these are consolidated into a central, waxy, often club-shaped body, which is known by the above name. Except in *Cypripedium*, only one of the anthers is developed.

Orchids differ considerably in habit, in the form and character of the stem, and in the arrangement and configuration of the leaves. In habit there are the climbing Vanillas, the Creeping Goodyeras; whilst some grow in reed-like tufts, others have an erect stem, with arching leaves, arranged in two regular rows on each side. Another group have no stem, but thick, fleshy leaves; and in others there is a creeping rhizome, from which stem-like growths are developed at intervals. These growths are known as *pseudo-bulbs*. They are not stems, nor are they leaf-stalks, but they appear to be intermediate between the two. Usually only one pseudo-bulb is developed at the apex or growing point of each rhizome yearly, and this bears leaves either at its apex or all along its sides. From its top, or sides, or base, the flowers are developed, usually only once in the existence of each, sometimes for several consecutive years. In some genera the pseudo-bulbs are of only annual duration, but in the majority they remain on the plant for an indefinite period.

Although infinitely more abundant in some regions than in others, Orchids are found in almost all parts of the world, except upon the verge of the frozen zone and in climates of excessive dryness. "In Europe, Asia, and North America," says Mr. Moore, "they grow everywhere —in groves, marshes, and meadows; at the Cape of Good Hope they abound in similar situations; but in the hot, damp parts of the West and East Indies, in Madagascar and the neighbouring islands, in the damp and humid forests of Brazil, in the warm, mild parts of Central

Structure and other Peculiarities.

America and Western Mexico, in the damp, tropical parts of India, and in the lower mountains of Nepal, they flourish in the greatest variety and profusion, not only seeking their nutriment from the soil, but clinging to the trunks and limbs of trees, to stones and bare rocks, where they vegetate among ferns and other shade-loving plants in countless thousands." The Orchids of temperate Australia and New Zealand are chiefly terrestrial, as are those of other temperate regions. They have fibrous roots, and often large fleshy tubers. Those of warmer countries are mainly epiphytes, not parasites, as they are often miscalled. A parasitic plant obtains its nourishment from the tree or plant upon which it grows, as is the case with the mistletoe; but an epiphyte merely uses the branch as a support or resting-place, gaining its food from the surrounding atmosphere.

Although small-flowered, and somewhat inconspicuous in stature, our native Orchids are both pretty and interesting. Differing altogether from the Peruvian and Mexican beauties with which we are more especially concerned, they exemplify almost as thoroughly the extraordinary variety in form and colour for which the Order is so remarkable, and if not as strikingly beautiful are by no means to be despised, even from an ornamental point of view.

The knowledge of *Orchideæ* has grown during the last fifty years at a rate quite disproportionate to that of the rest of the Vegetable Kingdom. Linnæus only knew about a dozen exotic Orchids, and stated his opinion that the world, when fully examined, might probably yield as many as a hundred species. Now, at least some thousands are known to English horticulturists, while the number of species in the Order is correspondingly large.

In colouring, as in odour, Orchids display an almost endless variety. Their rarest colour is blue, which, indeed, is almost unrepresented in collections—save, perhaps, in *Vanda cærulea*—although many purples in which blue predominates may be found. Several terrestrial Cape species, however, produce flowers of an intensely sky-blue colour, one of which was on this account appropriately named *Herschelia cælestis* by Lindley, in honour of Sir John Herschel, the astronomer. In one or two genera it is the

Structure and other Peculiarities.

leaves rather than the blossoms that attract the horticulturist, as in the case of the exquisite species of *Anœctochilus* and *Goodyera*, the rich green or purplish leaves of which are traversed by a beautiful network of gold or silver veins. Some species of *Phalænopsis* and of *Cypripedium* have prettily-marked foliage. On the whole, however, the Orchid family is conspicuously wanting in species with ornamental foliage.

The odours of Orchids are most diverse, varying even in the same species at different stages of its existence. Some have an especially delicious and almost overpowering fragrance, such as *Aërides odoratum* and *Lycaste aromatica*. Mr. Bateman enumerates only a few of the various odours which they represent when he likens the scent of *Stanhopea grandiflora* to that of a chemist's shop, that of *Bulbophyllum cocoinum* to cocoa-nut milk, of *Oncidium ornithorhynchum* to fresh hay, of *Gongora galeata* to wallflowers, of *Maxillaria atropurpurea* to violets, of *Aërides odoratum* to pomatum, of *Epidendrum anisatum* to aniseed, of *E. umbellatum* to angelica, of *Maxillaria crassifolia* to noyeau, of *Lycaste aromatica* to cinnamon, of *Gongora atropurpurea* to allspice, of *Burlingtonia* (*Rodriguezia*) *candida* to citron, of *Dendrobium moschatum* to musk, and of *Cycnoches Loddigesii* to honey. *Bulbophyllum Beccari* and *Masdevallia vilifera* have a disgustingly fœtid odour. The odour of some—as of *Epidendrum nocturnum* and *Brassavola* (*nodosa*) *grandiflora*—is only perceptible at night. Among our British Orchids there are several—such as the Butterfly Orchis (*Habenaria bifolia chlorantha*) and the Sweet-scented Orchis (*Gymnadenia Conopsea*)—the fragrance of which is greatly intensified towards evening.

Some species give out different scents at different times, such as *Dendrobium nobile*, which smells like grass in the evening, like honey at noon, and has in the morning a faint odour of primroses; while some, such as one or two species of *Epidendrum*, are fragrant in the morning and scentless at night. In others the fragrance is perceptible only in the evening. Our common British Purple Orchis (*O. mascula*) is remarkably variable in this respect—while faintly fragrant during the day, it is at night often so unpleasant in odour as to be unbearable in a

Structure and other Peculiarities.

room; but this varies much in different specimens. This list does not comprise more than a small fraction of the number of Orchids which have powerful odours. Indeed, it might almost be said that scentless Orchids are the exception.

HYBRIDISATION.

Although the art of Orchid Hydridisation may still be termed in its infancy, there cannot be two opinions as to the prominent part it must play in the future. The collector carries on his work of destruction when procuring the various species which, as in the case of *Odontoglossum crispum*, are put upon the European markets by hundreds of thousands annually. This, combined with the spread of civilisation, the extended cultivation, and the gradual pressure of a dense population, will ultimately result in the extinction of many of the most popular species now grown. If any proof of this were necessary, we need only refer to our native *Cypripedium Calceolus*, which has become virtually extinct in this country, but owing to its extensive distribution over central Europe it is still comparatively plentiful in places. Though the process of extinction may be slow, it is sure. It is thus, then, that we shall have to depend on the work of the cultivator to retain the species by raising them from seed, as well as by procuring new sorts by means of cross-fertilisation.

The art of Orchid Hybridisation was first introduced by the late Mr. J. Dominy, in the nurseries of Messrs. J. Veitch and Sons, at Exeter. Mr. Dominy, upon the suggestion of Dr. Harris, a surgeon of that town, commenced his experiments in 1852. It was in October, 1856, that the first hybrid (*Calanthe Dominii*) flowered. Mr. Dominy carried on the work successfully among the various sections of the Orchid family for twenty years, flowering during that time about twenty-five hybrids—the last, and probably the best, being *Lælia*, now classed as *Lælio-Cattleya Dominiana*, which flowered in 1878.

Mr. Seden, who succeeded Mr. Dominy in the firm named, has been most successful in introducing hybrids of sterling merit. Other nurserymen, gentlemen, and

Hybridisation.

gardeners in private establishments have likewise taken up the work in such earnest that there is scarcely an establishment in this country in which Orchids are appreciated that does not contain seedlings of some of the different genera. Continental and American horticulturists have also developed the work successfully.

There are many in the past who have hesitated and delayed experimenting in raising seedlings. One of the principal reasons for this delay has been the common but erroneous notion that it takes practically a lifetime before the plants raised from seed may be induced to flower. True, it has taken over twenty years in the bygone days to induce plants to flower, but it must not be overlooked that present-day horticulturists have many facilities afforded that were not vouchsafed to our forefathers; and with the more advanced knowledge to assist us, we are enabled to considerably shorten the time that elapses between the sowing of the seed and the flowering of the plants.

The writer of these notes has been successful in flowering plants in a little over two years from the time of sowing the seed, and there are very few indeed of the large family of Orchids which, with proper treatment, would require more than five or six years to reach the flowering stage. The injury caused to plants used for hybridisation purposes has also worked prejudicially against the general spread of hybridisation. There is no denying that in many cases the strain of fructification does considerably distress the plants, and it frequently takes two or three years for plants so affected to regain their normal conditions ; but surely if a crop of seedlings are procured there is ample repayment for the sacrifice of the mother-plant. The more general practice of hybridisation is sufficient to indicate that most of the prejudices against it are now being overcome.

Selecting Plants.

The chief thing to be considered in the selection of the seed-bearing parent is general good health and condition. One cannot expect to procure satisfactory seeds from plants having weakly constitutions, or that are in a condition that they are unable to retain their seed-pods for

Selecting Plants.

the lengthened period required for them to develop and mature their seeds. Plants in an unsuitable condition quickly show signs of the strain placed upon them, by the early shrivelling of the pseudo-bulbs. Although the seed-pod may go on for the full period usually required for development, it will be found that at the time of bursting very little, if any, seed will be contained in the interior, and that only a fluffy substance, very light in colour, remains. To get satisfactory results, therefore, it is advisable to give due consideration to the condition of each plant before using it for hybridisation purposes.

The selection of parents must also be considered. It is useless to expect satisfactory results unless some little forethought is given. Superior kinds should be selected, and those widely distinct from each other. It does not always follow that the superior qualities of one parent will atone for the shortcomings of the other with which it has been crossed. As an illustration of this, attention may be drawn to the fact that *Cypripedium Spicerianum*, one of the finest species of the genus, has been used as one of the parents in the production of over one hundred distinct crosses, yet it would be difficult indeed to select a dozen among these that are of exceptional merit.

In the selection of parents to produce new hybrids, we would suggest that the list of hybrids contained at the end of certain genera should be used as a guide to that end, and also for the reproduction of those hybrids which have already appeared, and which have proved of sterling merit. There is a wide field of possibilities still open to the hybridist in the direction of bigeneric hybrids. With the exception of Cypripediums, the construction of the flowers in almost the whole of the Orchid genera is favourable to the production of seedlings by cross-fertilisation. The efforts in this direction, although limited up to the present, have produced satisfactory results: one of the finest of these is to be found in *Epiphronites Veitchii.*

When to Fertilise the Flowers.

During the bright months of the year (March to September) there need be very little consideration given to

When to Fertilise the Flowers.

this matter, but for choice we should advise the morning portion of the day for the purpose. During the duller months of the year we prefer operating when the sunlight is strongest, from, say, ten to two o'clock. Owing to the prevalence of dull weather in the winter months, especially in the fall of the year, it is a difficult matter to attain success, for after the flower has been fertilised the decaying portions of the segments frequently convey decomposition to the more sensitive parts of the flowers after fructification has considerably advanced, causing the whole to rot.

Period between Fertilisation and Fructification.

There can be no doubt but that fructification commences immediately the sexual portions of the flowers are brought together. In the case of Oncidiums, Cattleyas, Lælias, Odontoglossums, &c., the segments of the flowers begin to wither within a few hours. In fact, we have observed that insects coming into contact with the stigma frequently set up sufficient irritation to cause the flower to wither and decay.

Treatment after Fertilisation.

To procure good seed it is advisable that the plants carrying seed-vessels should be given every encouragement that will be likely to assist in its production. One of the principal considerations, therefore, is that they should be afforded all the available light. It is not necessary to place the plants in such a position that the direct rays of the sun may destroy the foliage and otherwise unduly distress them; but at the same time, every encouragement must be given that will assist them to properly ripen the pods, or good seed cannot possibly be procured. A position near the roof-glass generally satisfies their requirements in this direction.

The period that elapses between fertilisation and the ripening of the seed-pods differs very considerably. In the case of the South American Selenipediums, a few months suffice for the pods to reach maturity; but with

Treatment after Fertilisation.

Cattleyas and Cypripediums, from nine to fifteen months elapse before the seed-vessels are mature, a period indicated by the bursting of the pod. The longer the seed-pod remains on the plants, the greater are the possibilities of procuring good seeds. As soon as it is discovered that the seed-pods are bursting, they should be carefully tied up in tissue-paper, so that the seed, should it drop, may be secured. It generally takes a considerable time for the outer portions of the seed-pods to become dry, especially if allowed to remain on the plants. It is advisable, therefore, to remove them from the plants, and place them under such favourable conditions as may facilitate the ripening process. The seed will be ready for sowing as soon as it can easily be shaken out of the pod.

Methods of Sowing Seed.

The old system of sowing the seed of Orchids on an established plant of the same family, is one that is most satisfactory in such cases as *Cypripedium*, *Phaius*, and, others of this section; but there are others—say where the plants require a season of rest—in which it would be exceedingly undesirable to sow seed, for it would mean the sacrifice of the old plant if the requirements of the seedlings are to be supplied.

As there are other means of raising plants from seed, it is not advisable to sow Cattleyas and their allies, or Dendrobiums, on the plants of their respective genera. Another method of sowing seed is to procure a piece of pitch-pine, bruise it well, and either suspend it in a moist position as a raft or place small pieces in pans, first soaking the material in water, and then sowing the seed while wet. Rough-sawn pieces of white deal, such as would be cut from the sawing asunder of a scaffold-pole, is a most suitable surface on which to sow the seed; but for this system it is necessary that the conditions should be fairly hot and a high state of humidity be maintained at all times. The blocks should be fitted into pans and suspended near the roof-glass.

One of the best systems we have found for the raising of Cattleya seedlings is to use shallow pans containing about one-third their depth of clean, broken crocks, the

Methods of Sowing Seed.

remaining portion consisting of coarse Fern roots left when picking the peat for potting, broken small and mixed with a little charcoal. This should be throughly wetted

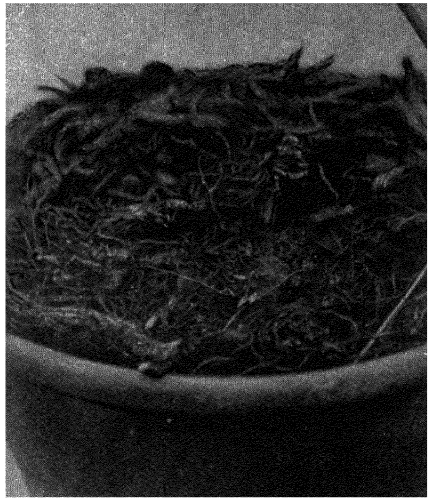


FIG. 6. ORCHID SEEDLINGS AT TWO MONTHS.

before the seeds are sown. Fig. 6 represents a pan of this description with Cattleya seedlings two months from the sowing of seed. Cocoa-nut fibre is favoured by many as a suitable surface on which to sow the seeds, but we find that it commences to decay too early, and the surface has a tendency to become sour, although we have found that shut up in a propagating-case it answers the purpose admirably. Wet brickbats standing in a pan of water (similar to what is practised by some in the raising of Fern seedlings) may also be successfully employed for inducing the seed to germinate. Whichever system is adopted, it is absolutely necessary that the surface should be thoroughly wet before commencing to sow the seeds; for if sown on a dry surface, they are so light that they quickly float off, and are thus destroyed.

Methods of Sowing Seed.

The period that elapses between the sowing and germination of the seeds varies considerably. Sometimes indications of the vitality of the seed may be observed in from seven to ten days. In other cases we have known the seed to come up after having been sown two years; cases also frequently occur in which the first batch of the seed has germinated quickly, while other batches sown at the same time, even on the same receptacle, will continue to make their appearance for two or three years afterwards. The treatment of the seed from the time of sowing up to the rooting period of the plants that have germinated therefrom is an operation that requires considerable care and judgment. The principal item, of course, is the watering. To dip the tiny dust-like germs of seed when in a dry state would result in floating the seeds from off the surface of the material on which they had been sown. To water carelessly,



FIG. 7. ORCHID SEEDLINGS AT SIX MONTHS.

even from the finest rose on the water-can, quickly displaces the growing seedlings, and they are thus washed over the sides of the pots and are lost. It is therefore

Methods of Sowing Seed.

necessary to take precautionary measures to prevent this, and the best means of overcoming the difficulty is to use a small spray-diffuser, similar to those found in florists'



FIG. 8. ORCHID SEEDLINGS AT TWO YEARS.

shops; the water is forced out in a fine mist-like spray. This we find answers the purpose admirably. The periods between sprayings will vary according to the outside conditions of the atmosphere. In bright, warm weather the seedlings will require damping twice a day; but in dull, cool weather, probably once or twice a week will be sufficient. This must be left to the discretion of the operator. Care must also be observed to prevent the small seedlings from becoming dry, especially if these are hung in a light position near the roof-glass. Seedlings, if once allowed to become dry, shrivel, after which the tiny plants rarely regain their normal condition, and

gradually dwindle and die. Excess in either case must be avoided.

Potting Seedlings.

The best time at which to remove the seedlings is just immediately after the first or seed-leaf has reached maturity, and when the miniature root makes its appearance. We advocate that the sooner the plants can be induced to become established in their independent pots, the better. The illustration (Fig. 7, p. 27) will give a fair indication of the condition of the seedlings when they may be safely handled, provided that the roots are active, and the plants, as far as growth is concerned, are in a dormant condition. We would prefer their being potted before the stage indicated in the illustration, so that the roots shown might in the meantime have become established in the potting compost; for in a young stage they are very tender subjects to handle, and particular

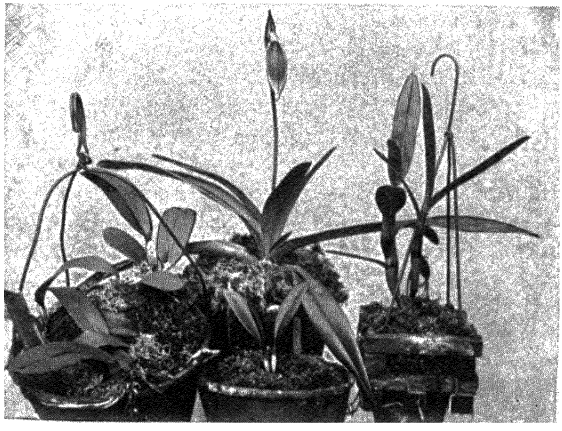


FIG. 9. ORCHID SEEDLINGS AT FOUR YEARS.

care is required lest they become injured in the operator's hands during transplanting. We advise those not familiar with the treatment of seedling Orchids to

Potting Seedlings.

defer potting up the plants until they are sufficiently large to be conveniently handled. The size of the pots used depends on the vigorousness of the plants being dealt with. There are pots about an inch in diameter that are most suitable for seedling Cattleyas, Dendrobiums, and such-like. Cypripediums, which are stronger rooting and of more vigorous constitution, may be treated more liberally as regards pot-room. We find it best to plunge the tiny pots into pans of peat, which are then suspended close up to the roof-glass. The pots are about half filled with clean, finely-broken crocks, the potting compost consisting of finely-chopped peat roots and sphagnum in about equal proportions, and a little rough sand or broken charcoal may be added with advantage. After potting, the plants are thoroughly watered before being placed in their permanent position, when every encouragement is given to induce them to grow freely.

As the plants advance, considerably more room will be annually required. It is not advisable, when the plants have become attached to the receptacle, to turn them out of the pots at the period when repotting is required, especially when dealing with Cattleyas in the early stages. Far better is it to remove all decayed and undesirable material, replacing the same with clean drainage. Next procure a pot or pan of the desired size, and place the plant with the pot attached to the roots into it, after filling in with liberal drainage, cover the remaining surface with the potting material, which should become coarser as the plant reaches maturity. As soon as the plants have passed out of the small stage, they are best placed in close proximity to the roof-glass. This may be done by means of a shelf suspended from the rafters. Especially is this desirable with Cattleya seedlings during the dullest months of the year. As the illustrations (Figs. 8 and 9, pp. 28 and 29) show, the plants, under favourable circumstances, make considerable advance after the first two years, and they may then be more liberally treated. One of the principal things to endeavour to prevent, as far as possible, is premature growth. If a plant commences a secondary growth immediately after, or perhaps before, the preceding growth reaches maturity, the chances are that a growth

Potting Seedlings.

will be advancing during the whole period in which the plant should have been at rest. The result of this will be (especially if premature growth commences in autumn) that neither of the pseudo-bulbs will be properly ripened, they will be prone to decay during the dull winter months, and the future well-being of the plants will be very doubtful and uncertain. It is better to remove the plants to cooler and more airy conditions when growth is completed, so that they may have the full advantage of the resting season, returning them to their growing quarters as soon as there are traces of renewed vitality in the early spring of the year. Insects and other pests will have to be held in check by the methods advocated under that heading, p. 10.

On the Laws of Plant Inheritance.

A considerable amount of prominence has been given to this subject in the *Journal of the Royal Horticultural Society*, the *Orchid Review*, and other horticultural and scientific publications, and as these have been particularly directed to Orchid hybrids we feel that the matter is of so much interest, that it should not be overlooked in this work. The discussion has arisen from what is termed "Mendel's Law," which, simply stated, is as follows: If two distinct but corresponding characters (*A* and *a*) be united by crossing, and the resulting crosses be self-fertilised, the progeny as regards this pair of characters will separate themselves according to the formula $A + 2Aa + a$, showing, on the average, that out of every four plants raised, one will take after the original character *A*, two will be intermediate *Aa*, and one will take after the original character *a*. In other words, one half will be intermediate, and the other half retain the original characters. This law of Mendel's was applied to Peas, but it has since been apparently confirmed by other independent observers in the case of numerous other genera.

In the issue of the *Journal of the Royal Horticultural Society* for April, 1902, Capt. C. C. Hurst has an admirable paper on "Mendel's Law Applied to Orchids," in which an extensive analyses of numerous hybrids of the Orchid family are admirably expounded. Notwith-

standing, however, that we have those facts so clearly brought before us in the above paper, we fail to see how "Mendel's Law" can be applied to hybrid Orchids generally. And for this reason: we have obtained hybrids true from seed, or in other words hybrids that have reproduced themselves from being fertilised with their own pollen. We have also found that many of the secondary hybrids, which have been inbred, or in other words, fertilised with one of either of the original parents, instead of reverting to the parent of which it contains three parts, have become far more distinct than either of the primary hybrids. This has been the case in several instances that have come under our notice.

In all hybrids, primary and secondary, we have found there has been considerable variation; it would be a difficult matter indeed to obtain two plants identically the same. Extremes are far more frequent: pure white and exceedingly dark variations such as were found by Mr. Norman Cookson when he obtained *Calanthe* Sibyl, a pure white, and *Calanthe* Ruby, probably the darkest Calanthe in cultivation, from the same seed-pod. We cannot therefore discern how, or in what way, Mendel's Law can be applied where such extremes as these are apparent, and especially when these extremes retain their permanent characters by reproducing themselves from seed.

We find that in some of the primary crosses (for example one of the *Fairieanum* section of hybrid Cypripediums that many successful hybridists have been experimenting with for years, in the endeavour to intercross these hybrids, and thereby obtain a secondary hybrid that may develop more of the characteristics of the well nigh extinct *C. Fairieanum*), it is a difficult matter indeed to get intercrosses, or to procure seed-pods, when these hybrids have been fertilised with their own pollen; and even where we have succeeded in getting seed-vessels, when they have become ripened they have contained, on examination, unfertile seeds, from which no results have been obtained. We believe this to be the only practical test that has been extensively tried with Orchids which may be strictly applied to Mendel's Law of Inheritance.

SPECIES, VARIETIES, AND HYBRIDS.

ACACALLIS.

A monotypic genus of the tribe *Vandeæ*, from Brazil. The generic name is of doubtful origin. The species is a stove, epiphytal Orchid, with a short, leafy stem, at length thickening into a pseudo-bulb. It is distinguished from *Aganisia* by the curious lip appendage, and by the large auricles of the column. It requires to be cultivated suspended in a moist position of the stove or East Indian-house. On account of its climbing habit it is best attached to a raft. It is rarely met with in cultivation, and has become almost extinct in this country.

A. cyanea (*Lindl.*).—The flowers of this species have been described as being of the colour of "the well-known *Vanda cærulea*. There are, however, darker blue blotches, quasi-tessellated over the flower. The lip is veiled, and has two very small basilar teeth, and then a veiled middle lacinia that is sacciform, bordered with most remarkable long bristles, and with a deep violet blotch on its middle part beneath. The white column has two cartilaginous, quadrate arms close to the stigmatic hollow."

ACAMPE.

About nine species of stove, epiphytal Orchids of the tribe *Vandeæ* are included in the genus *Acampe* (*Lindl.*). They are mostly natives of the East Indies and Southern China, and are closely allied to *Saccolabium*. Indeed, Hooker, in his "Flora of British India," includes them under that genus. The name is derived from *akampes*, inflexible, and is in reference to the brittleness of the flowers. Flowers much smaller than in *Vanda*, shortly pedicellate; sepals free, sub-equal, somewhat fleshy; petals similar, but rather narrower; lip sessile at the base of the column, continuous, spreading, saccate or conico-spurred at the base; column short and thick; peduncles lateral, rigid, short and simple, or elongated and panicled; leaves

Acampe.

distichous, coriaceous; stem leafy, not pseudo-bulbous. These plants are of botanical interest only, and as the species are not in general cultivation, we refer our readers for a list of species to "The Dictionary of Gardening," 1900 Supplement, p. 5. Acampes require similar cultural treatment to *Aërides*, *Saccolabium*, *&c.*

ACANTHOPHIPPIUM.

These very peculiar terrestrial stove or East Indian-house Orchids, of the tribe *Epidendreæ*, are natives of India and the Malayan Archipelago. The origin of the generic name, for which Blume stands sponsor, is not apparent. The species are of botanical interest chiefly, and are not recommended for general cultivation. Flowers rather large, racemose, few; sepals combined in a broad, oblique pitcher, including the petals, which are adnate to the base of the column; column short, produced into a long foot; pseudo-bulbs oblong; leaves few, large, longer than the scapes. The plants thrive well in a compost of sandy peat and sphagnum, with a little lime-rubble or tufa-stone intermixed, to retain a porous condition of the compost: the drainage should be clean and ample. They are best grown in pans. Descriptive references to the various species will be found in "The Dictionary of Gardening."

ACINETA.

Lindley's name for a genus of Orchids, of the tribe *Vandeæ*, allied to *Peristeria*. There are some half-a-dozen species in cultivation, natives of either Tropical America or Mexico. The flowers are sub-globose, fleshy, borne on short, pendulous racemes; the leaves are lanceolate, membranous, ribbed, and the pseudo-bulbs angular, and about as large as a hen's egg. The generic name is in reference to the jointless lip (from *akineta*, immovable).

Culture.—Acinetas require the temperature of the intermediate-house throughout the year. Owing to the plants producing their flower-racemes from the base of the

Acineta.

pseudo-bulb, and piercing the potting compost, they require an outlet at the bottom of the receptacle in which they are growing. They are best suited, therefore, for culture in baskets, and should be suspended near the roof-glass. The baskets should be well drained, and the potting compost should consist of two parts fibrous peat to one of sphagnum. A liberal amount of moisture, both at the root and in the atmosphere, is necessary during the growing season. When at rest, only sufficient moisture should be supplied to keep the pseudo-bulbs in a plump state. The flower-spikes, from their first appearance, are several months in developing, and the flowers last about a fortnight after expansion.

A. Barkeri (*Lindl.*).—Flowers in stout, pendent spikes, 1ft. long, numerous, large, fleshy, the petals and sepals incurved in such a way as to give the flowers a globose form; colour golden-yellow, with dark red spots on the lip. They are developed in summer. Native of Mexico. Syn. *Peristeria Barkeri.* (B. M., t. 4203.)

A. densa (*Lindl.*).—Flowers and spikes as in *A. Barkeri*, but larger and less rounded, whilst the petals are thickly dotted inside with red. They are developed in autumn. Native of Central America. Syn. *A. Warscewiczii.* (B. M., t. 7413.)

A. glauca (*Lindl.*).—A synonym of *Lueddemannia Pescatorei.*

A. Humboldtii (*Lindl.*).—The flowers are large and rounded, the sepals brownish-purple in colour, with numerous darker spots, the small petals and lip rosy-red, and the column whitish. Flowering time, spring. A native of Colombia. Syn. *Peristeria Humboldtii.* (B. R., 1843, t. 18.)

A. Warscewiczii (*Klotzsch*).—A synonym of *A. densa.*

A. Wrightii.—The plant described under this name is *Lacæna spectabilis.*

ACRIOPSIS.

Under the above name, given by Reinwardt, are found some pretty stove, epiphytal Orchids of the tribe *Vandeæ.* They are natives of Borneo and Java, but little known to cultivation. The name is derived from *akros*, top, and *opsis*, an eye. *A. javanica* (*Reinw.*) is sometimes grown.

Acriopsis.

The flowers are small, arranged in loose panicles; lip adnate to the very curious column, from which it projects at right angles. It requires the East Indian-house conditions.

ACROPERA (*Lindl.*).
See **Gongora.**

ADA.

This small genus of the tribe *Vandeæ* is very nearly allied to *Brassia*. It differs, however, in various technical details, especially in having the lip parallel with, and solidly united to, the base of the column. Lindley's name is a complimentary one. The two species known to cultivation are among the prettiest of cool-house Orchids, the bright colour of their flowers being particularly effective. The cultural requirements are the same as those recommended for *Odontoglossum*.

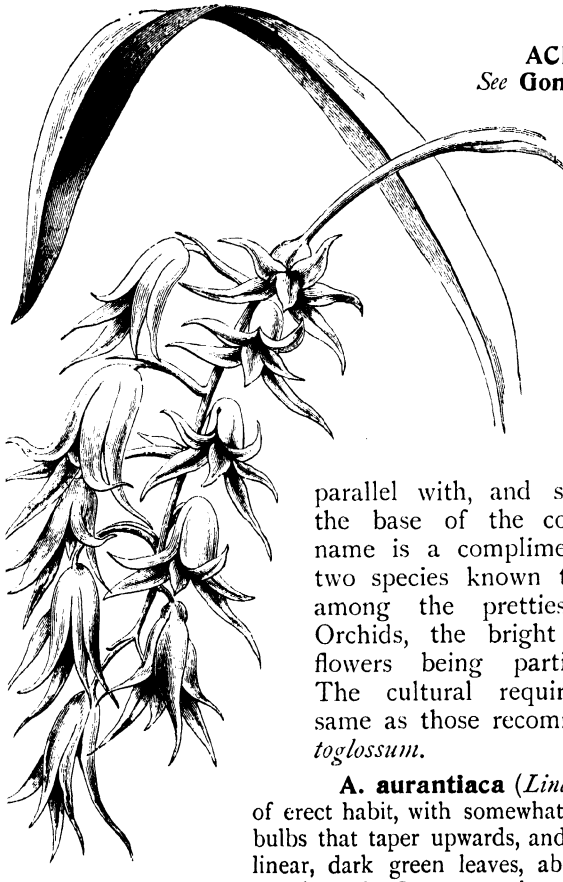


FIG. 10. RACEME AND LEAF OF ADA AURANTIACA (⅓ nat. size).

A. aurantiaca (*Lindl.*).—A small plant of erect habit, with somewhat cylindrical pseudobulbs that taper upwards, and bear two or three linear, dark green leaves, about 5in. or 6in. in length. The flowers are borne in long, terminal, arching racemes, each of which produces from six to ten blossoms; the sepals and petals are narrow and pointed, and of a clear, bright, golden-orange colour, never expanding, except at the tips. They are produced about March, and last several weeks in perfection. The plant is a native of Colombia. (Fig. 10; B. M., t. 5435.)

Ada.

A. Lehmanni (*Rolfe*).—This has the habit of *A. aurantiaca*, but slightly narrower and more rigid leaves, marbled with grey, and erect scapes 8in. long, bearing five to eight cinnabar-orange flowers. Introduced from Colombia in 1888. It flowers in summer.

AEONIA.

Lindley does not explain the above name (also spelt *Oeonia*), which he bestowed upon a small genus of stove Orchids, of the tribe *Vandeæ*, natives of Madagascar, and closely allied to and requiring the same cultural conditions as *Angræcum*. Flowers racemose, shortly pedicellate; sepals and petals sub-equal, free; lip sessile at the base of the column, produced into a spur at base; column very short; peduncles lateral, simple. Leaves distichous. Stems not pseudo-bulbous. The only species in cultivation is *A. polystachya* (*Benth.*), whose flowers resemble those of a *Brassavola*, but are spurred; the sepals and petals are whitish or greenish; base of the lip green; racemes numerous. Introduced in 1889.

AËRANTHES.

Lindley's name for a monotypic genus, of the tribe *Vandeæ*, from Madagascar. It is doubtless from the same derivatives as the next genus. The species requires a stove treatment, with cultural conditions as recommended for *Angræcum*.

A. grandiflorus (*Lindl.*).—A remarkable bloom of a creamy-white tint, whose sepals, petals, and lip, at the extremities, turn to a primrose-yellow hue as the flower ages. (B. R., t. 817; G. C., 1895.)

AËRANTHUS.

In the past this genus, founded by Reichenbach fils, has been one for botanists to juggle with. Most of the species found under the name are now transferred to *Angræcum* and *Dendrophylax*, while it is doubtful if the remaining species, *A. Curnowianus* (*Rchb. f.*), is now in general

cultivation. The name is from *aer*, air, and *anthos*, a flower, and is in allusion to the habit.

A. Curnowianus (*Rchb. f.*).—This is a very distinct plant, with yellowish-white flowers; sepals and petals ligulate, acute; lip cuneate-obovate, retuse; spur filiform, five times as long as the lip. The leaves are fleshy dull green, and rather rough. The stem is dwarf. Madagascar, 1883.

A. Leonis (*Rchb. f.*).—The plant known by this name is *Angræcum Humblotii*.

AËRIDES.

An extensive genus of Orchids, of the tribe *Vandeæ*, and founded by Loureiro. It is confined to the tropics of the Old World, and includes many large and showy-flowered species. They are all epiphytes, growing upon the trees which overhang the rivers and streams, and forming in many instances strikingly beautiful objects. The strap-shaped, recurved leaves are arranged in two regular rows, one facing the other. They are usually jagged or lobed at the apex, as if a piece had been cut out or broken off; in most of the species they are channelled down the middle, but in a few kinds they are linear or nearly cylindrical. All of them throw out large, fleshy roots from various parts of their stems, by which they absorb the moisture from the atmosphere. It is to this aërial mode of growth, so to speak, that the genus owes its name, which was bestowed upon it, towards the end of the last century, by a Catholic missionary in Cochin China, to whom we are greatly indebted for our knowledge of the vegetation of that region. He found there the plant which he named *Aërides odoratum*, and of which we shall speak hereafter. This plant, he tells us in his original description, published in 1790, has this wonderful property, that, when brought from the woods where it grows into a house, and suspended in the air, it will grow, flourish, and flower for many years without any nourishment, either from the earth or from water. "I would scarcely have believed this," he adds, "had I not had daily experience of it." The name Flos Aëris, or Air Flower, had, however, previously been applied to certain other epiphytic Orchids. The white, fleshy roots, by which the cases of *Aërides* cling to

Aërides.

their supports, are in some species of very remarkable appearance. In one Indian plant they are long and flat, and resemble a tapeworm in appearance; hence the species has been named *A. tæniale.* The flowers, which are of a firm, waxy texture, and often very fragrant, grow in long, cylindrical clusters or racemes, which spring from the axils of the upper leaves; they are of various shades of white, lilac, and rose. The lip is curiously curved or opened, and affords a character by which the species may be divided into two sections. "In the first, represented in *A. odoratum*, the lip is cut into three, or even five lobes, of nearly equal length; in the other, represented in *A. maculosum*, the lip is undivided, or has only a couple of basal ears."

Aërides are not so extensively cultivated as they were a few years back. There is a tendency amongst Orchidists of the present day to confine themselves to a few species. This is to be regretted, for while there may be a particular desire to cultivate certain species and varieties, this should not be carried to such an extent as to exclude many noble species to be found among the Eastern section. It cannot be contended for a moment that they possess less charm in their flowers, or that they lack grace, for there are no Orchids that add more to the appearance of the house than are to be found in the combined genera of *Vanda* and *Aërides.*

Culture.—Where these plants can be afforded a division to themselves, little difficulty will be found in dealing with them satisfactorily. They may be placed in either pots, pans, or teak-wood baskets, with a few broken crocks at the bottom. The plants having previously been turned out of the pots should be cleared of all dead and decaying material about the roots. Any plant that has lost its lower leaves, giving it a leggy appearance, should have as much of the stem as the roots will permit cut away, so as to bring the leaves to within a reasonable distance of the top of the receptacle. When this has been done, place the stem in the centre, and work as many roots as possible inside the pot, fill in the remaining space with more broken crocks, and finish the surface with a layer of chopped sphagnum, pressing it moderately firm. Water thoroughly

with rain-water poured through a moderately coarse rose. The best time to re-pot *Aërides* is during March, as they immediately enter on their growing season after this period. During the active season they require an abundant supply of moisture, both at the roots and in the atmosphere. As soon as the resting period arrives (which is indicated by the sealing over of the apex of the roots), moisture must be gradually reduced, and during winter little water is needed, either at the roots or in the atmosphere; but drought should never be carried far enough to cause the leaves to shrivel, a fair amount of flower, coupled with good leafage, being preferable to an abundance of bloom at the expense of the health of the foliage.

As before remarked, *Aërides* are peculiar to the Eastern tropics, and therefore are usually classed amongst the Orchids that require tropical treatment. This is, to some extent, correct; yet they do not require the great amount of heat that many imagine, and that until recently has been given them. During the winter season we have succeeded in keeping many of the species at a temperature of from 55deg. to 60deg., whilst during the growing season—that is, from April to September—the temperature is allowed to run up by sun-heat to 85deg. or 90deg., so long as a free circulation of air and a sufficiency of moisture are secured. Except when the sun is powerful, the temperature at this time should be 70deg. to 75deg. by day, and 70deg. by night. Excepting where otherwise stated the plants to be described require the above conditions. The following are still in commerce:

A. affine (*Wall*).—This is but a synonym of *A. multiflorum*.

A. crassifolium (*Rchb. f.*).—One of the best and most popular of the *Aërides*. It is a free grower, with stout, erect stems, bearing thick, leathery, deep green leaves, about 8in. long, and drooping racemes of large, rose-purple flowers, the lip being almost purple. The sepals are oval, the petals recurved, and the lip is divided into three blunt lobes, the front one being large, tongue-shaped, and projecting forward. The flowers, which are deliciously fragrant, are produced in May and June. Native of Burma, where it is very abundant. Introduced by the Rev. C. S. Parish in 1864. (W. S. O., 3, t. 12.)

A. crispum (*Lindl.*).—A tall, robust plant, with an erect habit, producing an abundance of charming flowers. The deep green

Aërides.

leaves are flat and broad, two-lobed, and about 8in. long; the stem is generally purple. The racemes are more than double the length of the leaves, and the flowers are nearly 2in. in diameter; they are white, suffused with purplish-rose, and very fragrant; the sepals and petals are ovate, and the lip is three-lobed, the middle lobe being very large, toothed at the base, and fringed at the margin; the horn-like spur is slightly incurved. This beautiful species blooms during May and June, and lasts a long time in flower. Introduced from Bombay, and first flowered in England in 1841. (Fig. 11; B. M., t. 4427.)



FIG. 11. FLOWER OF AËRIDES CRISPUM (nat. size).

Several varieties of this plant are in cultivation, the best of which are as follow:

Var. *Lindleyanum* (*Wight*) has large, much-branched panicles of flowers, with white sepals and petals, and a large, bright, rich rose-coloured lip.

Var. *Warneri* has a slender stem, the short leaves are dark green, and the sepals and petals white, with a rich rose-purple lip having a white margin.

A. Emericii (*Rchb. f.*) has the habit and general characters of *A. virens*, but the leaves are longer and narrower, and two-lobed at the tips. The flowers are white and rosy-lilac, of medium size, and they are borne in drooping racemes. It flowers in the late autumn. Introduced from the Andamans in 1882. (B. M., t. 6728.)

A. expansum (*Rchb. f.*).—A dwarf kind, with recurved, channelled, light green leaves, and unbranched spikes of white and rose-purple flowers. The lip is large and projecting, deeper-coloured on the middle lobe, and the spur is rather large and incurved. For small houses this plant is well adapted, as it grows and flowers freely if planted in a teak basket, and suspended near the roof-glass in a warm house. A native of Burma. There seems little if anything to distinguish this from *A. falcatum.*

A. falcatum (*Lindl.*).—Well known in gardens, and a most distinct and beautiful species. The leaves are nearly 1ft. long,

and their colour is a peculiar blue-green. The racemes are pendulous and many-flowered; the sepals and petals are white, blotched at the apex with crimson; the lip is white at the sides, with a rosy-crimson centre, ciliated on the front lobe; the spur is short, and parallel with the lip. It grows well under ordinary treatment, and flowers freely in May and June. Introduced from India in 1846. The specimens in cultivation are difficult to distinguish from *A. expansum.* (X., i., t. 92.)

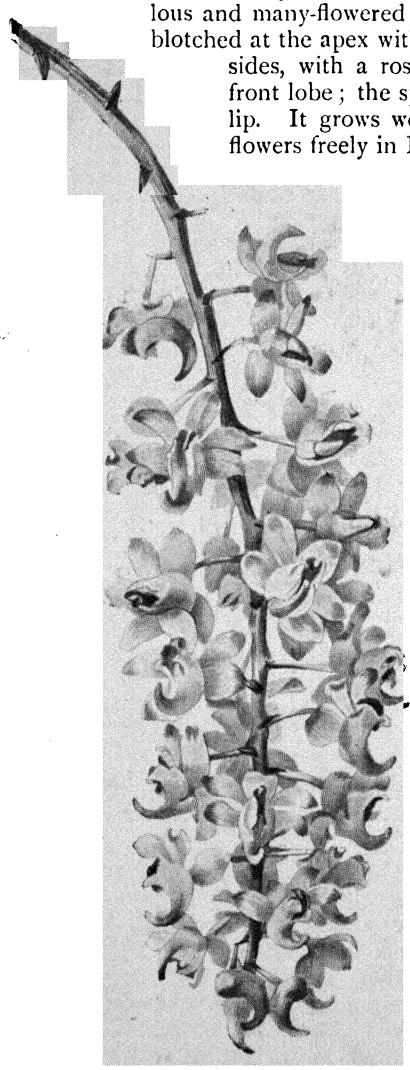


FIG. 12. PORTION OF RACEME OF AËRIDES LAWRENCEÆ (much reduced).

A. Fieldingii (*Lindl.*).—This handsome species is popularly known as the Fox-brush Orchid, on account of its long, curved racemes, which are densely furnished with flowers. It grows to a height of about 2ft., and the leaves are 8in. to 10in. long, broad, thick, and fleshy, and obliquely two-lobed at the apex, of a dark green colour, except at the base, which is brownish-black in the portion that clasps the stem. The raceme is about 1½ft. long, and sometimes branched; the numerous flowers are large and white, beautifully mottled with bright rose, the labellum being wholly rose. It is one of the finest of East Indian Orchids, and should be included in all collections. It blossoms during June and July, lasting for several weeks in full beauty. A native of Assam, Sikkim, &c.

Var. *album* differs from the type in having entirely white flowers.

A. Huttoni (*Hort.*).—*See* **Saccolabium Huttoni.**

Aërides.

A. japonicum (*Rchb. f.*).—A diminutive species, with short, narrow, leathery leaves, and drooping racemes, each bearing six or eight flowers, which are white, barred and spotted with purple. It thrives in the intermediate-house. It is an interesting species. The flowers appear in June or July. A native of Japan; introduced in 1862. (B. M., t. 5798.)

A. Lawrenceæ (*Rchb. f.*).—One of the grandest of all *Aërides*. The racemes are 1ft. or more long, and bear numerous large, waxy flowers, with broad, upturned, pitcher-shaped spurs; the sepals are waxy-white, becoming yellow with age; the petals are white, tinged at the tips with purple; the middle lobe of the lip is deep purple, the other parts of the flower being waxy-white or green. It is impossible to convey anything like a true idea of the richness and beauty of this plant by means of a description. The flowers are developed in September. Native of the Philippines. (Fig. 12.)

Var. *Sanderianum* (*Rchb. f.*) differs from the type in having the flowers creamy-yellow. It is a very desirable variety.

A. Lobbii (*Lem.*).—A synonym of *A. multiflorum*.

A. maculosum (*Lindl.*).—A somewhat slow-growing plant, of rather stiff and dwarf habit, and bearing bright, handsome flowers. The leaves are thick and fleshy, rounded at the apex, 8in. or 9in. long, and dark green. The pendulous racemes are somewhat lax and branching. The flowers are large, with obtuse, pale rose-coloured sepals and petals, freely spotted with purple. The lip is flat, bluntly ovate, and of a deep rosy-purple. The fragrant flowers are produced in June and July, and last about four weeks in perfection. It should be grown in shallow pans or baskets, suspended in a light position of the stove or East Indian-house. Introduced from Bombay in 1844. (B. R., xxxi., t. 58.)

Var. *Schrœderi* is a much stronger grower, and larger in all its parts than the type. The flowers are white, tinged with amethyst-purple. One of the rarest and most beautiful *Aërides* in cultivation.

A. mitratum (*Rchb. f.*).—A distinct and attractive species, remarkable on account of its narrow, almost rush-like, drooping foliage, the numerous thick roots which spring from the base of the very short stem, and the dense, erect racemes of flowers, in which the sepals and petals are white and the broad, obtuse lip is rose-purple. This species is best grown in a shallow teak basket. It likes plenty of atmospheric moisture, and a position near the glass in a stove. Moulmein, 1864. (B. M., t. 5728.)

A. multiflorum (*Roxb.*).—A dwarf-growing species, with long, pendulous racemes of delicate rose-tinted flowers. Well known in cultivation as *A. Lobbii*, *A. roseum*, and *A. affine*. Moulmein.

Aërides.

A. odoratum (*Lour.*).—Although perhaps the commonest *Aërides* in cultivation, it may take rank amongst the most beautiful. The leaves are strap-shaped, recurved, and dark green. The racemes are longer than the leaves, many-flowered, and pendulous. The flowers are very fragrant, the sepals and petals creamy-white, tipped with purple, and the lip is three-lobed, the middle lobe being ovate and inflexed, the spur conical and incurved, and of the same colour as the sepals. It flowers in May, June, and July. The original *A. odoratum* was among the first of the tropical Orchids introduced to this country, having been sent to Kew Gardens, from China, by Sir Joseph Banks, in 1800. It is a native of various parts of India, and also of China and Cochin China, and is often cultivated in those countries for house decoration on account of the beauty and fragrance of its blossoms. (B. M., t. 4139.)

There are several varieties of this species; of these, *majus* and *purpurascens* are the best.

A. quinquevulnerum (*Lindl.*).—The leaves are strap-shaped, some 12in. long, tightly clasping the stem at the base, and of a bright shining green. The raceme is longer than the leaves, pendulous, and many-flowered, the flowers being large, dense, and fragrant. The sepals and petals are rounded, white, marked with five reddish-crimson blotches (from which the species takes its name), and tipped with purple. The lip is cucullate, and funnel-shaped, the side lobes being erect, and the centre lobe oblong, incurved and serrated, of the same colour as the sepals; spur conical, green. It flowers during late summer and early autumn. Introduced from the Philippines by Cuming, in 1837, and has since been found in Timor. (P. M. B., viii. 241.)

A. radicosum (*A. Rich.*).—Flowers ¾in. across; sepals and petals light rose-purple, spotted with deep purple, the lateral sepal largest; lip three-lobed, the mid-lobe rich rose-purple; spur horn-like, compressed; pedicels pale rose-purple; peduncles racemose, rarely branched. A native of Southern India. Syn. *A. rubrum* (of gardens).

A. Rohanianum (*Rchb. f.*).—A synonym of *R. suavissimum.*

A. roseum (*Lodd.*).—A synonym of *A. multiflorum.*

A. rubrum (*Hort.*).—A synonym of *A. radicosum.*

A. Sanderianum (*Rchb. f.*).—A synonym of *A. Lawrenceæ Sanderianum.*

A. suavissimum (*Lindl.*).—A handsome, robust-growing plant, which attains a considerable height when well treated. The leaves are flaccid, some 10in. long, light green, and profusely freckled with brown dots. The numerous flower-spikes are

half-pendulous and branched, bearing a profusion of deliciously fragrant flowers. The sepals and petals are bluntly ovate, white, tipped or tinged throughout with deep lilac. The lip is three-lobed, the side lobes being oblong and serrated, and the middle lobe small and bifid; the whole lip is of a pale lemon colour, and the spur is rosy-red. It flowers in June and July, and was introduced from the Straits of Malacca in 1848. Syn. *A. Rohanianum.*

A. Vandarum (*Rchb. f.*).—A distinct plant with terete foliage. The flowers are borne, two or three together, on short spikes; they are pure white, 2in. across; sepals and petals narrowed to a stalk at the base, wavy and crisped at the margins; lip three-lobed, the two side lobes standing erect like a pair of ears, the front one very irregular and twisted; spur long, nearly straight. Native of Northern India. Flowers in winter. (B. M., t. 4982.)

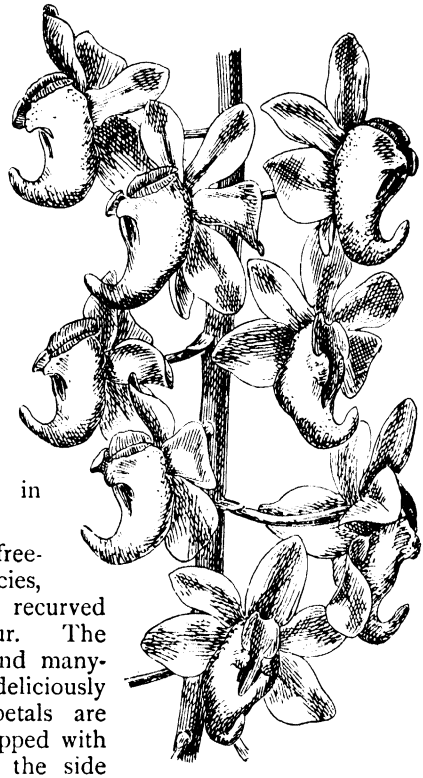


FIG. 13. PORTION OF RACEME OF AËRIDES VIRENS (⅔ nat. size).

A. virens (*Lindl.*).—A free-growing, handsome-flowered species, with strap-shaped, channelled, recurved leaves, pale green in colour. The racemes are long, drooping, and many-flowered, the blossoms being deliciously fragrant. The sepals and petals are rounded and peach-coloured, tipped with rosy-purple; the lip is large, the side lobes are toothed at the apex, white, dotted with crimson. This species begins to flower as early as April, lasting until July; it was introduced from Java in 1843. An easily-managed plant, requiring ordinary treatment. (Fig. 13; B. R., 1844, t. 41.)

Var. *Dayanum.*—Racemes very long; flowers large, and bright in colour.

A. Warneri (*Hort.*).—A synonym of *A. crispum Warneri.*

AGANISIA.

Botanically interesting epiphytal Orchids, of the tribe *Vandeæ*, natives of tropical America. The genus was established by Lindley, and the name is from *aganos*, desirable. The cultural requirements are as for *Angræcum*. Though three or four species are catalogued by specialists, only the two described below rightly belong to the genus as now constituted. The plants known as *A. cærulea* (*Rchb. f.*) and *A. cyanea* (*Rchb. f.*) are both now referable to *Acacallis cyanea*.

A. ionoptera (*Nichols*).—Flowers white; petals violet; sepals tipped and streaked with violet. Introduced from Peru in 1871.

A. lepida (*Lindl.*).—Flowers pure white, about 1½in. across, very handsome, disposed in tall, many-flowered spikes; leaves erect, grass-like. Introduced from Brazil in 1893.

AINIA (*Lindl.*). *See* **Tainia.**

AMBLOSTOMA.

Of the genus *Amblostoma* (*Scheidw.*), belonging to the tribe *Epidendreæ*, there are some three species, only one of which is now in cultivation. This requires intermediate-house treatment, and similar culture to *Epidendrum*. The generic name is from *amblos*, blunt, and *stoma*, a mouth, and is in allusion to the form of the pollinia.

A. cernuum (*Scheidw.*).—Flowers small, creamy-yellow and greenish-white, produced from the apex of slender pseudo-bulbs. Syn. *A. tridactylum*.

A. tridactylum (*Rchb. f.*).—A synonym of *A. cernuum*.

ANGRÆCUM.

Some of the most remarkable Orchids known belong to *Angræcum* (*Thou.*), of the tribe *Vandeæ*. The genus is sometimes known as *Aërobion* (*Kaempf.*), and, as now constituted, includes *Listrostachys* (*Rchb. f.*). The flowers are usually white, and, in many of the species, large and handsome. A large number of new additions have been made to the

Angrœcum.

cultivated kinds in recent years, so that the genus now occupies a first place amongst tropical Orchids. Generally, the habit of the plants resembles that of *Vanda* and *Aërides*, to which, indeed, they are botanically related.



FIG. 14. ANGRÆCUM SESQUIPEDALE
(much reduced).

Some—*A. eburneum* for instance—are very large and robust, others—such as *A. falcatum* and *A. bilobum*—are very diminutive. The flowers are borne on lateral racemes, which are sometimes branched; the sepals and petals are usually equal and spreading, the lip is broad and flat, and

Angræcum.

the spur is long and tail-like. Many of the species are very fragrant, and last several weeks in bloom. They blossom freely when in health, and, with few exceptions, are happy under cultivation. Nearly all the known kinds are natives of tropical Africa and Madagascar, or the adjacent islands.

Culture.—With the exception of *A. eburneum* and *A. sesquipedale* (Fig. 14), all the members of this great genus that are in cultivation are of dwarf habit, and are suitable for cultivating in baskets or shallow pans in which they may be suspended near the roof. *A. Scottianum* should be placed in a basket, and the terete stems wound round a block, stood in the centre, the block having been previously covered with sphagnum. The potting compost required by the other members of the genus consists of a layer of good sphagnum, made moderately firm about the base of the plant, the remaining space having been previously filled in with clean, broken crocks so as to afford ample drainage. Angræcums, with the exception of *A. falcatum*, require the humid conditions of the stove at all seasons of the year, and must not at any time be allowed to suffer from lack of moisture at the roots.

The following species are selected as being the most desirable among the extensive genus; all are in cultivation.

A. articulatum (*Rchb. f.*).—A dwarf species, with ovate leaves 3in. to 5in. long, two-lobed at the apex, glossy green. Flower-spikes jointed, pendulous, 1ft. long, clothed with pure white flowers 1½in. in diameter, with short red stalks; lip oblong, larger than the sepals and petals; spur straight, 4in. long. It blooms in autumn. Native of Madagascar; introduced in 1870.

A. bilobum (*Lindl.*).—Flowers white, sometimes tinted rose, 1½in. in diameter; spur 2in. long, produced from the sides of the stem just above the two-year-old leaves; racemes pendulous, 6in. or more long, bearing about twelve to fifteen fragrant flowers in winter. Cape Coast, 1841.

A. caudatum (*Lindl.*).—A. handsome plant, 8in. to 12in. high, with strap-shaped, recurved leaves, 10in. long, and horizontal spikes of flowers, arranged in two regular parallel rows; sepals and petals brownish; lip large, pure white, with a long, projecting point, and a spur 9in. long, coloured brown. A pretty

species, lasting in flower several weeks. It blooms in the autumn. Native of Sierra Leone; introduced in 1834. (B. M., t. 4370.)



FIG. 15. ANGRÆCUM ELLISII
(much reduced).

A. Chailluanum (*Hook.*).—Flowers white; sepals and petals narrow, acute; spur yellowish-green, 4in. or more long; racemes pendulous, 8in. to 10in. long. Leaves 6in. long, and 1½in. broad, slightly wavy, two-lobed at the apex. Arranged in

Angræcum.

an imbricate manner. Flowers in autumn. Introduced from West Africa in 1846.

A. citratum (*Rchb. f.*).—A small species, with spathulate, bright green leaves, on a short stem, and slender, horizontal spikes of small, jewel-like flowers, arranged with their faces upwards, creamy-white, the spur thin, greenish. One of the prettiest of miniature tropical Orchids. Flowers in summer. Native of Madagascar; introduced in 1865. (B. M., t. 5624.)

A. eburneum (*Thou.*).—A large, robust plant, 3ft. or more in height, with long, thick, strap-shaped leaves, of leathery texture, light green in colour. Flower-spikes erect, stiff, bearing numerous large flowers, in which the petals and sepals are narrow and green, whilst the broad, cordate lip is pure white; they last in perfection nearly two months, and emit a most delicious fragrance all the time. Native of the Mascarene Islands; introduced about 1830. Flowers in summer. (B. M., t. 4761.)

Var. *virens* has smaller flowers, the lip being greenish-white.

A. Ellisii (*Rchb. f.*).—A dwarf plant, with broad, tongue-shaped leaves, 10in. long, bright green, bilobed at the apex. Flower-spikes arching, 1½ft. long, bearing numerous pure white, fragrant flowers, 2½in. in diameter; spur 6in. long, hanging downwards. One of the prettiest of the smaller species. It flowers in autumn. Native of Madagascar; introduced in 1870. (Fig. 15.)

A. falcatum (*Lindl.*).—A small plant, with narrow, channelled leaves, and short racemes of small, white flowers, which are fragrant and lasting. Native of Japan. This little plant, which flowers in spring, requires the temperature of a cool Orchid-house. (B. M., t. 2097.)

A. fastuosum (*Rchb. f.*).—Flowers ivory-white, scented like tuberoses, numerous, racemose; sepals and petals ligulate-oblong; lip ovate; spur filiform, 2in. to 3in. long. Leaves cuneate-oblong, 3in. broad, blunt, and unequally lobed at the apex, wrinkled, the margins cartilaginous. A spring-flowering species, introduced from Madagascar. (B. M., t. 7204; G. C., 1885, xxiii., p. 533.)

A. funale (*Lind.*).—A synonym of *Dendrophylax funalis.*

A. Humblotii (*Rchb. f.*).—The flowers are pure white, borne on short racemes. The leaves sword-like, stout, falcate. Height 6in. to 10in. A native of the Comoro Islands. 1885. Syn. *Aëranthus Leonis.*

A. modestum (*Hook.*).—A beautiful little plant, with shining green, tongue-shaped leaves, the margins tinged with red; length about 6in. Flower-spikes 1ft. long, drooping, and bearing two rows of snow-white flowers, 1½in. across; the sepals and petals



VANDA TRICOLOR.

spreading, the lip triangular, and the spur 3in. to 4in. long. Native of Madagascar. This is a delightful plant, and very free-flowering; the spikes are graceful and the flowers lasting. Introduced in 1880. Syn. *A. Sanderianum.* (B. M., t. 6693.)

A. Sanderianum (*Rchb. f.*).—A synonym of *A. modestum.*

A. Scottianum (*Rchb f.*).—This is a distinct little plant, the stems being numerous, wiry, and usually twisted; leaves terete, about 4in. long, deep green. Flowers in pairs, on short, axillary spikes, each flower being 2in. across, pure white, the lip large and pointed, and the spur 6in. long, and yellowish. It blooms in summer. Native of the Comoro Islands; introduced in 1878. (B. M., t. 6723.)

A. sesquipedale (*Thou.*).—This extraordinary plant has become famous as one of the Orchids which Charles Darwin was specially interested in, on account of the exceptional length of its spur. The stem is erect, and hidden by the clasping bases of the broad, recurved, strap-shaped leaves, which are deep green, keeled, 1ft. long, and bilobed at the apex. Flowers on axillary spikes—strong plants producing four flowers on each spike—ivory-white, 6in. or more across, waxy in appearance; the sepals and petals equal, overlapping at the base, narrowed upwards to a point; lip large, heart-shaped; spur as thick as a goose-quill, about 1ft. long. The flowers are generally produced in the early winter, lasting nearly a month; they are very fragrant. Native of Madagascar; introduced in 1855. This noble species requires tropical treatment, and an abundance of water at the root. There is also a spring-flowering variety of this species. (Fig. 14; B. M., t. 5113.)

The following is a garden-raised hybrid.

Veitchii = *sesquipedale* and *eburneum* (Veitch).

ANGULOA.

Ruiz and Pavon founded this genus of the tribe *Vandeæ*, and it was named in compliment to Angulo, a Spanish naturalist. The species are large, stately plants, with the habit of *Lycaste Skinneri*, but more robust even than that plant. They have large, conical, furrowed pseudo-bulbs, broad, plaited foliage, and erect flower-spikes. The flowers are large, cupped, very waxy in substance, and attractive in colour. Their peculiar shape has led to their being likened to a large tulip; while another peculiarity has earned for them the name of Cradle Orchid,

Anguloa.

owing to the lip being so delicately balanced that the slightest movement causes it to rock backwards and forwards. All the species are massive rather than graceful, and they owe their popularity to size, colour, and fragrance.

Culture.—These plants are easily grown, thriving in an intermediate-house temperature throughout the year. Pots or deep pans are most suitable for them, and these should be large enough to contain a liberal allowance of soil, with plenty of drainage. They like an abundance of water when growing, but when at rest they require only sufficient to maintain a plump condition of the pseudo-bulbs. The new growth springs from the base of the last-ripened pseudo-bulb, and the flowers develop along with it. When growth commences, it goes on rapidly, the large, handsome foliage unfolding very vigorously. The flowers last about a fortnight or three weeks, and emit a powerful fragrance. The leaves fall off the new pseudo-bulb as soon as it is ripe. The time most favourable for re-potting these plants is just after the flowers have been removed. The roots should not be much disturbed. The most suitable compost is a mixture of turfy loam and peat, with a small proportion of fine dry cow-dung, and a little sphagnum and rough sand. Loam should be omitted from the compost when the plants are being cultivated within the area of smoky districts.

A. Clowesii (*Lindl.*).—This has broad, plaited leaves, and large, tulip-like, fragrant flowers, and is an extremely handsome plant. The colour of the broad sepals and petals is bright yellow; the inclosed lip is white, tinged with orange. It blooms in May and June. Native of Colombia. (B. M., t. 4313.)

A. eburnea (*Hort.*).—The flowers are pure white, save for a few pink spots upon the lip. It blossoms during June and July, and is a native of Venezuela.

A. Ruckeri (*Lindl.*).—Flowers similar in size and shape to those preceding, tawny yellow, profusely crimson-spotted; lip wholly crimson. It flowers during June and July, and is a native of Colombia. (B. R., 1846, t. 41.)

Var. *sanguinea* has the inside of the sepals and petals deep blood-red; it is very rare. (B. M., t. 5384.)

A. uniflora (*Ruiz* and *Pav.*).—The flowers are large, pure white sometimes freckled with brown. It flowers in June

and July, and is a native of Colombia. Syn. *A. virginalis.* (B. M., t. 4807.)

A. virginalis (*Hort.*).—A synonym of *A. uniflora.*

ANŒCTOCHILUS.

Blume's name for a small genus of ground Orchids, of the tribe *Neottieæ*, and allied to our native "Lady's Tresses" (*Spiranthes æstivalis*). Botanists describe about eight true species, referring all the others to allied genera, or reducing them to the position of varieties merely. The generic name is from *anoiktos*, open, and *cheilos*, a lip, and is in allusion to the spreading apex of the lip.

The flowers of these plants are so small and unattractive that they need not be described here. Indeed, most cultivators of Anœctochili prefer to remove the flower-spikes as soon as they appear, so as to prevent their exhausting the plant. All the kinds have short, fleshy, creeping stems, from which roots are emitted more or less freely on the lower side. The leaves are arranged in a rosette, or alternately on the stem, and vary in form from orbicular to lance-shaped; they are succulent, very tender, and usually their veins are picked out in rich and beautiful colours, golden, silvery, olive, and even rose-coloured reticulations often covering their whole surface. Under favourable conditions, each leaf remains on the plant three, five, or even eight years, retaining the brilliancy of its colours the whole of that time. All the species are natives of tropical Asia, the most beautiful being found in Ceylon and Java.

Culture.—Although considered somewhat difficult subjects to deal with, yet when a position suited to their requirements is found, they need perhaps less attention than any other species of Orchid in cultivation. They like a warm, humid position in a house, or a position in a house where the temperature can be retained at a fairly even condition of 65deg. to 70deg. Plants did well with the writer for a great number of years in a house in which *Phalænopsis* throve. Though small pieces to commence with, they are now so large that it is difficult to cover them with a bell-glass of the largest size

Anœctochilus.

procurable for horticultural purposes. These plants have been re-potted annually in May, the new growths making their appearance about that time. The last season's growth is divided from the previous year's, and the stock has been thereby considerably increased. The potting compost consists of fibrous peat (one part) and chopped sphagnum (two parts), mixed with a liberal sprinkling of finely-broken crocks. The plants are then thoroughly watered, and after being arranged on a shallow inverted pan on the stage, the bell-glass is replaced. Owing to the amount of moisture that accumulates inside the bell-glass, little water is necessary. Imported plants of the allied genera have been similarly treated, and with satisfactory results. Instances have occurred in which the plants have succeeded under the close conditions of a propagating-house, and without any protection whatever.

A. argenteus (*Hort.*).—A synonym of *Physurus pictus.*

A. concinnus (*Hort.*).—A beautiful little plant, the leaves being 5in. long by 3in. broad, gradually narrowed to a point at the apex, rounded at the base; the ground-colour is deep olive-green, through which run stripes and a network of a coppery-red colour. Native of Assam.

A. Dawsonianus (*Low*).—A synonym of *Hæmaria Dawsoniana.*

A. Frederici-Augusti (*Hort.*).—A synonym of *A. xanthophyllus.*

A. Lowii (*Hort.*).—A synonym of *Dossinia marmorata.*

A. Petolus (*Hort.*).—A synonym of *Macodes Petola.*

A. regalis (*Blume*).—This is known in Ceylon as the King of the Woods (Wana Rajah), and in England it is considered the most beautifully variegated plant known. The soft, velvet-like brown of the leaves, and the thick reticulation of sparkling gold, baffle description, nor can they be truthfully represented by the artist. Some of the forms are much more beautiful than others, that known as *cordatum* being, perhaps, the finest. The best varieties are natives of Ceylon and Singapore, the poorer kinds coming from the Neilgherries. Syn. *A. setaceus.* (B. M., t. 4123.)

A. Reinwardtii (*Blume*).—A delicate little plant, with thin, watery stems, bearing roundish leaves about 1½in. long, the surface coloured deep bronze, with a velvet-like sheen, and thickly covered with interlacing lines of deep, shining gold. It is a native of Malaya, and a little gem when in good health.

Anœctochilus.

A. Rollissoni (*Hort.*)—A synonym of *Goodyera Rollissoni.*

A. Roxburghii (*Lindl.*).—Stem 3in. to 6in. long, very fleshy; leaves 2½in. by 1½in., ovate, the surface deep bronzy-green, with a broad band of silvery grey running along the mid-rib from the base almost to the apex; veins shining, coppery red. A beautiful plant, which was once fairly common in gardens, but is now rarely seen. It is a native of Northern India and China.



FIG. 16. ANŒCTOCHILUS XANTHOPHYLLUS
(⅔ nat. size).

A. Sanderianus (*Kranzl.*).—A synonym of *Macodes Sanderiana.*

A. setaceus (*Blume*).—A synonym of *A. regalis.*

A. striatus (*Hort.*).—A synonym of *Zeuxine regia.*

A. xanthophyllus (*Planch.*).—A strong, free-growing plant, with the habit of *Macodes Petola*, but slightly longer and more pointed in the leaves. Strong plants produce leaves 2½in. long and 1½in.

wide, rather fleshy, and coloured very dark velvety green, with reticulating lines of pale green and yellow, and a central area of bands of pale gold. This species is a native of Ceylon, where it grows in moist woods in shady places, along with *A. regalis*. Syn. *A. Frederici-Augusti*. (Fig. 16.)

ANSELLIA.

A small genus of tropical African Orchids of the tribe *Vandeæ*. It was established by Lindley. The pseudo-bulbs are stout and woody when old; they vary in length from 1ft. to 4ft., and they bear about a dozen leaves near the apex. The flowers are borne in large, branching panicles, usually from the apex, but sometimes from the sides of the pseudo-bulbs. Each flower is about 2in. across; the sepals and petals are equal and spreading, and the lip is three-lobed. The colour is some shade of yellow, with blotches of brown. The genus is named after Mr. John Ansell, who discovered *A. africana* in Fernando Po growing on a palm-tree.

Culture.—These plants require stove treatment all the year round. They should be planted in pots or pans half-full of drainage, using as compost peat fibre and sphagnum. Whilst growing they require plenty of water both at the root and overhead; and they should have as sunny a position as is possible in the stove. When growth is finished, less water should be given. The time to re-pot is just as new growth commences. As these plants root freely, they should be allowed plenty of pot room.



FIG. 17. FLOWER OF ANSELLIA AFRICANA (⅔ nat. size).

A. africana (*Lindl.*).—Pseudo-bulbs 4ft. high; leaves 1ft. long, with prominent ribs; panicles large, branching; flowers pale yellow, spotted with brown. Strong plants produce as many as fifty or more flowers in a panicle, and these remain six weeks in perfection. They are developed in winter. Native of Sierra Leone. (Fig. 17.)

A. a. nilotica (*Baker*).—A synonym of *A. nilotica*.

Ansellia.

A. confusa (*N. E. Br.*).—This differs from *A. africana* in having the petals scarcely broader than the sepals. Western Tropical Africa. (B. R., 1846, t. 30, as *A. africana*; B. M., t. 4965.)

A. congoensis (*Rodigas*).—Allied to *A. africana*, but freer. It has shorter pseudo-bulbs and smaller flowers, their colour being deep yellow, with purple-brown blotches; lip having whitish side-lobes, veined with purple, and a narrow yellow front lobe. Congo, 1886. (L. ii., p. 64.)

A. gigantea (*Rchb. f.*).—Allied to *A. africana*, but with smaller light yellow flowers, transversely barred with brown; a deep yellow lip, without warts on its middle lobe; and with more or less crenulate keels. Natal, 1878.

A. humilis (*Hort.*).—Flowers lemon-yellow, blotched and barred with chocolate; about 2in. in diameter; disposed in large panicles. A compact, free-growing species. Zambesi, 1891.

Var. *pallida* differs from the type in having the ground-colour of the flowers milk-white.

A. nilotica (*N. E. Br.*).—This has pseudo-bulbs about 2ft. long, and large flowers of a deep yellow colour, with large blotches of dark brown. It is the finest of all known Ansellias. Upper Nile Regions. Syn. *A. africana nilotica.*

APPENDICULA.

About a score of species of stove, epiphytal Orchids, belonging to the tribe *Vandeæ*, are found in the genus *Appendicula* (*Blume*). All have tufted leaf-stems. They are natives of tropical Asia, Australia, and Polynesia. The name is from *Appendix*, and is in allusion to the appendage at the base of the lip. Flowers usually minute; sepals connivent, the lateral ones connate at the base, and adnate to the produced foot of the column, forming a mentum; petals variable; lip erect, inverted on the foot of the column, or with its sides adnate thereto; column very short, the rostellum erect, bifid. About four species (*A. bifaria*, *A. callosa*, *A. monoceras*, and *A. Peyeriana*) are in cultivation, but they are only of botanical interest.

ARACHNANTHE.

Blume stands sponsor for this genus of the tribe *Vandeæ*. Some half-dozen species of stove, epiphytal

Arachnanthe.

Orchids comprise it: one is Himalayan, and the rest inhabit the Malayan Archipelago. The flowers have been fancifully likened unto spiders; hence the generic name, from *arachne*, a spider, and *anthe*, a flower. Flowers showy, sepals and petals free, spreading, rather thick; lip articulated at the base of the column, erect or spreading, neither saccate nor spurred at the base; lateral lobes erect, or rarely obsolete, the middle one fleshy, polymorphous, often gibbous, or with a very short spur at back; column short, thick; pollen-masses two; peduncles lateral, elongated, simple or branched. Leaves distichous, fleshy-coriaceous, sometimes very long, sometimes shorter or falcate, often obliquely bilobed at apex. The four or five species included here have, from time to time, been removed from one genera to another in a mysterious manner. They have appeared under *Epidendrum*, *Renanthera*, *Esmeralda*, and *Vanda*. Under the last name some are still retained in gardens. The species require similar treatment to that advised for *Aërides* and allied genera. *A. Cathcartii* grows best in an exposed position at the warm, moist end of the Cattleya or intermediate-house. During the active season of growth, the plant should have frequent sprayings. If placed against a wall the roots get hold, and this considerably assists them. The roots being principally aërial, little potting is required.

A. bella (*Rchb. f.*).—As the specific name suggests, this is a handsome plant. Sepals and petals light ochre, barred cinnamon, straight, cuneate-oblong; lip white, the lateral segments striped purplish-brown, the middle one very broad, tumid, the basilar, roundish callus white, spotted with brown; raceme, four-flowered. Leaves 5in. long, 1in. broad, shining, unequally bilobed at the apex. 1888. Syn. *Esmeralda bella.*

A. Cathcartii (*Benth.*).—"No more remarkable Orchid has been found in Northern India." So wrote Dr. Lindley at the time of its introduction in 1864. Subsequent knowledge compels us to somewhat modify this verdict, but *A. Cathcartii* still remains one of the most striking of Orchids. The tall stems are terete, and bear two opposite rows of pale green, narrowly-oblong leaves, about 6in. long, and unevenly lobed at the end. The flowers are 3in. to 4in. in diameter, and are produced, four or five together, on stout racemes. The sepals and petals are broad-oblong, overlapping each other; the ground-colour

Arachnanthe.

is pale yellow, but it is almost covered with transverse bands of reddish-brown. The lip is three-lobed, white, tinged with red on the side lobes, the margin of the middle lobe being yellow and curiously incurved. Sir Joseph Hooker, who discovered this Orchid, says that it inhabits hot valleys in the Eastern Himalayas, and is usually found in the neighbourhood of waterfalls. Syns. *Vanda Cathcartii*, *Esmeralda Cathcartii*. (Fig. 18; B. M., t. 5845.)



FIG. 18. FLOWER OF ARACHNANTHE CATHCARTII (nat. size).

A. Clarkei (*Rolfe*).—Flowers much as in *A. Cathcartii*. Sepals and petals dark brown, barred with ochre, yellowish inside, cuneate-oblong, obtuse; lip whitish, marked with brown, three-lobed, with a conical, acute spur; the front lobe cordate, oblong-elliptic, with a rough, lobulate border, and seven to nine whitish keels; the mouth of the spur covered by two retrorse crests, with another crest in the front. Himalayas, 1886. Syn. *Vanda Clarkei*. (B. M., t. 7077.)

Arachnanthe.

A. Lowii (*Benth.*).—A remarkable species, with a tall stem 1in. in diameter, bearing dark green, strap-shaped, leathery leaves, 2ft. to 3ft. long. The drooping flower-spikes are 6ft. to 12ft. in length, and slightly hairy, each bearing from thirty to fifty flowers; a plant under cultivation is recorded as having carried twenty-six spikes at one time. An extraordinary characteristic of this species is that of invariably producing, at the base of every spike, a pair of flowers which differ in shape, colour, and marking, from all the others. Under *Catasetum* a somewhat similar occurrence is alluded to; but in that genus the flowers on the same plant differ in being male and female, whereas in *Arachnanthe Lowii* there does not appear to be any sexual difference. The basal pair of flowers are tawny-yellow, dotted with crimson; the sepals and petals being lance-shaped and bluntish. All the other flowers are larger, and have lance-shaped, wavy, more acute sepals and petals; they are pale yellowish-green, irregularly blotched with a rich reddish-brown. The lip is about half the length of the sepals and petals, the whole flower being 3in. in diameter. A native of Borneo, where it is stated by Mr. Wallace to grow on the lower branches of trees, its flower-spikes nearly touching the ground. Syns. *Renanthera Lowii*, *Vanda Lowii*. (B. M., t. 5475.)

A. moschifera (*Blume*).—Flowers creamy-white or lemon, spotted with purple, large, resembling a spider, delicately musk-scented. A native of Java. A peculiar and rare plant. The old flower-spikes produce flowers for a long time, and should therefore not be cut as soon as the first blooms have passed.

ARGYRORCHIS JAVANICA. *See* Macodes javanica.

ARPOPHYLLUM.

Llave and Lexarza founded the genus *Arpophyllum*, a name derived from *arpe*, a scimitar, and *phyllon*, a leaf, the leaf being sword-shaped. It contains about six species, all of botanical interest. They belong to the *Epidendreæ*. The chief cultural requirement is a light position in an intermediate-house temperature. The plants thrive well when grown under the same conditions as *Cattleya*. The most prominent species is the one here described.

Arpophyllum.

A. giganteum (*Lindl.*).—Flowers dark purple and rose, densely and symmetrically arranged on the cylindrical spikes, which are from 12in. to 14in. long. Leaves dark green, about 2ft. long, borne on slender pseudo-bulbs. A native of Mexico.

ARUNDINA.

Though some six species of the genus *Arundina* (*Blume*) are known, only one, *A. bambusæfolia*, is at present in cultivation. They are of the tribe *Epidendreæ*. The generic name is a diminutive of *Arundo*, and is in reference to the reed-like stems.

Culture.—These plants require a light position in the Dendrobium-house or stove, where only the bright rays of the sun are broken sufficiently to prevent scorching. During the growing season, abundance of moisture is required, with cooler conditions during the resting period. Belonging to the terrestrial class of Orchids, the potting compost should consist of good fibrous peat and loam, to which should be added a liberal sprinkling of rough sand or broken crocks to keep the material in a porous condition. Ample drainage should be afforded so as to avoid stagnation.

A. bambusæfolia (*Lindl.*).—This is a most distinct-looking plant, with large Lælia-like flowers; sepals and petals pale magenta-rose; lip rose, striped with orange on either side the white throat. Leaves pale green, ensiform. Stems 3ft. high, slender. Tropical Asia. (B. M., t. 7284.)

ASPASIA.

A genus of medium-sized epiphytal Orchids, of the tribe *Vandeæ*. They have the lip united to the column, and this gives rise to Lindley's generic name (from *aspazomai*, I embrace). The flower-spikes are produced from the base of the broad, thin pseudo-bulbs at the edge between it and the sheathing basal leaves.

The species require an intermediate-house temperature, and a compost of peat and sphagnum. A liberal supply of root moisture is needed while the plants are active. During the resting season sufficient only is required to

Aspasia.

keep the pseudo-bulbs in a plump state. The following are some of the best-known species in cultivation:

A. lunata (*Lindl.*).—Flowers green, white, and brown, solitary; sepals and petals linear obtuse, spreading; lip three-lobed, lateral lobes short, middle one flat, nearly square, wavy. Pseudo-bulbs oblong, two-edged. Height 1ft. Introduced from Rio Janeiro in 1843.

A. odorata (*Hort.*).—Sepals and petals white, with brown spottings; lip with violet centre. Native of Brazil.

A. principissa (*Rchb. f.*).—Flowers over 2in. across; sepals and petals light green, lined with brown; lip light buff, broadly pandurate, almost an inch long, with two parallel tubercles at the base. Introduced from Central America in 1888. An interesting species, with Odontoglossum-like flowers.

BARKERIA (*Kn.* and *Westc.*). This genus is now included under **Epidendrum.**

BARTHOLINA.

A monotypic genus of the tribe *Ophrydeæ*, from South Africa, the species, *B. pectinata*, or Spider Orchid, being terrestrial. It should be grown in a cool greenhouse; the remarkably small tubers are best accommodated in a compost consisting of fibrous peat, loam, and leaf-soil, with sufficient rough sand to render the compost porous. During active growth the plants require an abundance of root moisture. Overhead syringing in bright weather will also be beneficial. During the resting season little water will be required—only sufficient, in fact, to maintain the tubers in a plump condition. The name is a complimentary one of Robert Brown's to Thomas Bartholin, a famous seventeenth century physiologist.

B. pectinata (*R. Br.*).—The flowers, which are of a pale lilac, are 2in. to 3in. across the numerous spreading comb-like threads into which each segment of the three-parted lip is divided; sepals erect; petals straight or falcate; scape 3in. to 4in., and reddish-brown. They are produced in July. The leaves are solitary, orbicular, ½in. to 1in. in diameter, convex, deeply two-lobed, lying flat on the ground. Tuber ovoid, ⅓in. long. Introduced in 1787. (B. M., t. 7450.)

BATEMANNIA.

Of this much-confused genus, founded by Lindley, only two or three species are entitled to be classed here, and but two are met with in cultivation, and those not at all commonly. Several of the species formerly included here have been transferred to *Zygopetalum*. It belongs to the tribe *Vandeæ*. The name was bestowed as a compliment to Mr. J. Bateman, a collector and cultivator of Orchids and the author of a monograph on the *Odontoglossum*. The cultural requirements are similar to those necessary for the small-growing species of *Zygopetalum*.

B. Colleyi (*Lindl.*).—Flowers produced on a pendulous raceme rising from the base of the pseudo-bulbs; sepals and petals brownish-purple within, green without; lip white. British Guiana 1834. (B. R., t. 1714.)

B. lepida (*Rchb. f.*).—This species is closely allied to the preceding, but has an erect inflorescence and flowers twice as large and of more vivid colours; lip ligulate, trifid before the middle, side lobes narrowly triangular, with teeth; middle lobe cuneate obcordate. Brazil, 1878.

BIFRENARIA.

A genus of intermediate-house Orchids of the tribe *Vandeæ*, and allied to *Maxillaria*, but distinguished there from by having two frœna, or caudicles, to their pollen masses; hence Lindley's name of *Bifrenaria* (from *bi.* twice, and *frœnum*, a strap). They are natives of Guiana, Brazil, and Colombia. The cultural requirements are identical with those recommended for *Lycaste*. The small growing kinds are best accommodated in baskets or well drained shallow pans, suspended from the roof.

The following are the most prominent species in cultivation at the present time:

B. atropurpurea (*Lindl*).—Flowers 2in. across, fragrant; sepals and petals dull claret-red, stained yellowish in the centre; lip bright rose, suffused with white, incurved at the side, reflexed at the apex; scapes three- to five-flowered, oblong-lanceolate, 6in. to 10in. long. Pseudo-bulbs 2in. to 3in. long. Rio de Janeiro, 1828. Syn. *Maxillaria atropurpurea*.

B. aurantiaca (*Lindl.*).—A synonym of *B. inodora*.

Bifrenaria.

B. Charlesworthii (*Rolfe*).—Flowers yellow, with a few reddish-brown spots on the lip, about ¾in. long; scape 6in. long, bearing about six flowers. Leaves about 9in. long. Pseudo-bulbs quadrangular, 1½in. long. Brazil, 1894. This is allied to *B. racemosa.*

B. Harrisoniæ (*Rchb. f.*).—Flowers 3in. across; sepals and petals creamy-white, large and fleshy, the lateral ones with a spur-like base; lip purple, yellowish at the base, veined purple outside, the inner surface streaked with red; scape, one- or two-flowered. Brazil. Syns. *Colax Harrisoniæ*, *Dendrobium Harrisoniæ*, *Lycaste Harrisoniæ*, and *Maxillaria Harrisoniæ.* (B. M., t. 2927.)

B. inodora (*Lindl.*).—Flowers about 3in. across; sepals pale green, oblong, obtuse; petals brighter, but smaller; lip white, yellow, or dull rose, three-lobed, the middle lobe hairy and reflexed, the side ones erect. Rio de Janeiro, 1839. Syn. *B. aurantiaca.* (R. X. O. i., t. 94, f. 1.)

BLETIA.

Under the above name, bestowed upon it by Ruiz and Pavon, is found a large genus of terrestrial or epiphytal Orchids, several species of which are highly ornamental, and especially valuable because of the abundance and bright colours of their flowers. They are of the tribe *Epidendreæ*, and are related to *Phaius*; they are natives of tropical America, China, and Japan. The plants are characterised by having round or flattened pseudo-bulbs, clustered on a creeping rhizome, and bearing from the top several long, narrow, plaited leaves, which fall off in autumn. The name *Bletia* (after Don Louis Blet, a Spanish botanist) has also been given to a section of what is now known as *Lælia*—as, for instance, *Bletia Perrinii*, now called *Lælia Perrinii.*

Culture.—Bletias are not difficult to cultivate; they require liberal treatment when growing, and after that a long season of rest. The most suitable compost for them is a mixture of fibrous yellow loam and decayed leaf-soil, with a little silver-sand. The kinds described below being truly terrestrial, the pseudo-bulbs should be buried just beneath the surface of the soil; about 2in. of drainage is sufficient. These plants may be grown in the cool-house or in a heated frame. For well-established specimens

occasional applications of weak manure-water will be found beneficial. After flowering, the plants may be placed out of doors, plunging the pots in ashes, and leaving the leaves exposed to full sunshine. They should be taken indoors on the approach of cold weather, and be kept on the dry side until new growth appears.

B. acuminata (*Rchb. f.*).—A synonym of *Lælia rubescens*.

B. Gebina (*Lindl.*).—A synonym of *B. hyacinthina*.

B. Godseffiana (*Kranzl.*).—This is regarded simply as a small-flowered variety of *B. verecunda*.

B. hyacinthina (*R. Br.*).—A useful and a handsome species, and one of the hardiest; indeed, in favoured situations it has been grown outside. In the cool Orchid-house, its rosy-purple, graceful flowers produce a charming effect, and it well merits the little care necessary to grow it successfully. The leaves are long and plaited, and in spring, when the plant is in flower, are of a beautiful pale green, forming an admirable background for the rosy-purple flowers. The flowers are numerous, on scapes about 1ft. high, each flower measuring 2in. across; the lip is purple, streaked and edged with crimson. Introduced from China in 1802. Syn. *B. Gebina*. (Fig. 19; B. M., t. 1492.)



FIG. 19. PORTION OF RACEME OF BLETIA HYACINTHINA (much reduced).

B. patula (*Hook.*).—This handsome plant has rounded pseudo-bulbs, 2in. in diameter, and plaited leaves 1½ft. in length. The flower-spike rises from the young growth in March, and grows to 3ft. in height, bearing about a score of reddish-lilac coloured flowers, each upwards of 2in. across The base of the lip is white, as are also the six ridges occurring on the disk. During

Bletia.

growth this plant requires a warmer atmosphere than the others, and should be placed with the Cattleyas. A native of the West Indies; introduced in 1830. (B. M., t. 3518.)

B. Shepherdii (*Hook.*).—A strong-growing species, producing its long, branching spikes of flowers during the winter months. They are of a uniform deep purple colour, except the centre of the lip, which is nearly white. The leaves are broadly lance-shaped, and about 1½ft. long. A native of Jamaica; introduced in 1825. (B. M., t. 3319.)

B. Sherrattiana (*Batem.*).—This species is probably the prettiest of all. Its pseudo-bulbs are flattened, 2in. in diameter, and carry three or four plaited leaves, which taper towards each end. The flowers are of delicate texture, but large and showy; they are produced towards the top of an erect spike, 3ft. in height, twelve or more flowers occurring on a spike. The sepals and petals are of a bright rosy-red colour, and about 1in. long, the former being oblong in shape, and bluntish, and the latter being twice as broad, and rounded. The lip is three-lobed, of a deep rosy-purple, with three parallel, golden-yellow, raised lines, traversing the white centre. Introduced from Colombia in 1864. (B. M., t. 5646.)

B. verecunda (*R. Br.*).—An interesting plant, which is now and again imported and offered as new. It was the first introduced of all exotic Orchids, having been cultivated in England by Collinson in 1731. It has flattened, underground pseudo-bulbs, tall, plaited, grass-like foliage, and erect, branching racemes 2ft to 3ft. high, bearing numerous reddish-purple flowers. Compared with others here described, it is not beautiful, but it is worth growing for the sake of its historical interest. It requires a warm-house temperature, and blooms in summer. A native of Central America and the West Indies.

B. Woodfordii (*Hook.*).—A synonym of *Phaius maculatus.*

BOLLEA (*Rchb. f.*). *See* **Zygopetalum.**

BONATEA.

A terrestrial stove Orchid, of the tribe *Ophrydeæ*, allied to *Habenaria*, and requiring similar culture. The genus is named after Dr. Bonato, a distinguished Italian botanist.

B. speciosa (*Willd.*).—Flowers white, galeate; petals bipartite; racemes many-flowered, compact; bracts cucullate, acuminate. Introduced from the Cape of Good Hope in 1820. Syn. *Habenaria Bonatea.* (B. M., t. 2926; L. B. C., t. 284.)

BOTHRIOCHILUS BELLUS.

The plant sometimes met with under the above name is now correctly known as **Cœlia bella.**

BRASSAVOLA.

Closely allied to *Cattleya* and *Lælia* is this genus of epiphytal Orchids of the tribe *Epidendreæ*. In fact, so nearly is it allied, that *Lælia Digbyana* and *L. glauca* were at one time classed as Brassavolas. The name is a complimentary one to Dr. Brassavola, an eminent Venetian botanist, and was bestowed by Robert Brown. The species require similar conditions to those recommended for *Cattleya*, and to be suspended in such a position that they obtain an abundance of light.

B. acaulis (*Lindl.* and *Paxt.*).—A large-flowered species; sepals and petals long, narrow, greenish and creamy-white; lip large, heart-shaped, and pure white; base of the tube spotted with rose. Leaves very narrow and rush-like. Central America, 1852.

B. cucullata (*R. Br.*).—This species bears a very long-tubed flower on a short scape; sepals cream, tinged with red; petals white; lip three-lobed, the middle one beak-like. South America. By some authors this is considered synonymous with *B. cuspidata* (*Hook.*). (B. M., t. 543.)

B. cuspidata (*Hook.*)—A synonym of *B. cucullata.*

B. elegans (*Hook.*).—A synonym of *Tetramicra rigida.*

B. lineata (*Hook.*).—Flowers large, very fragrant; sepals and petals creamy-white; lip pure white. Leaves long, terete, tapering to a point, very green. South America, 1850.

B. venosa (*Lindl.*).—Flowers small and compact; sepals and petals white; lip creamy-white, strongly veined. Honduras, 1839.

BRASSIA.

In the genus *Brassia* (*R. Br.*), of the tribe *Vandeæ*, are included some thirty species. They are somewhat widely distributed over tropical America. There is very little difference, in a botanical sense, between *Brassia* and *Oncidium*, some botanists uniting the two under the latter name. Horticulturally, however, *Brassia* is very distinctly characterised by the long, tail-like form of its sepals and petals, and by the absence of wings from the sides of the

Brassia.

column. The name is in honour of Mr. William Brass, a botanical collector of the end of the eighteenth century. All the cultivated species are robust, free-growing plants, very similar to some Oncidiums in habit, and when strong they flower every year. The flowers are not remarkable for any brilliancy of colour, but they find many admirers on account of their large size and spider-like form.

Culture.—These plants succeed in either pots or pans; the drainage must be thorough, and they should be potted in good fibrous peat, with a little sphagnum and sand added. They should be placed in the intermediate-house, and be liberally supplied with water during the summer. In winter they should be kept in the same position, and given just sufficient moisture to prevent the pseudo-bulbs from shrivelling. The flowers remain in good condition a long time on the plants.

B. antherotes (*Rchb. f.*).—A handsome, free-growing plant, with healthy, green foliage, and stout flower-spikes, sometimes 2ft. or more in length, bearing many rich yellow flowers, each 7in. across; the sepals are long and narrow; petals only half as long, purplish-black at the base; lip triangular, yellow, barred with brown. Colombia, 1879.

B. brachiata (*Lindl.*).—Flowers very large, seven to ten on a raceme; sepals and petals yellowish-green, spotted near the base, 6in. long; petals 4in. long, with more spots at the base; lip bright yellow, the basal half with revolute margins; crest white, spotted with orange. Leaves linear-lanceolate, 9in. to 12in. long. Pseudo-bulbs 3in. to 5in. long. Guatemala, 1843. (B. R., 1847, t. 29.)

B. Gireoudiana (*Rchb. f.*).—A fine, bold-growing species, producing its many-flowered scapes of singular and beautiful flowers during the spring and early summer. The remarkable attenuation of the sepals, which is so characteristic of *Brassia*, is well exemplified in this species. In general character it resembles *B. Lanceana*, the sepals and petals being bright yellow, spotted and blotched with deep red, and the lip similarly coloured. Native of Costa Rica. (Xenia, t. 32.)

B. Lanceana (*Lindl.*).—A plant of robust growth, with dark green pseudo-bulbs and leaves, and a many-flowered scape. The narrow, tapering sepals and petals are bright yellow, blotched with brown, or sometimes with dull red; the lip is wholly yellow, slightly spotted at the base, and much waved. In the typical form the lip is rather more than half as long as the sepals. The flowers are deliciously fragrant, and last in full beauty for

two or three weeks; they are produced in summer. It is a native of Surinam, whence it was introduced by Mr. J. H. Lance, in 1843. (Fig. 20; B. M., t. 3577.)

Var. *macrostachya*. — A very large-flowered form, the sepals being nearly 5in. in length.

Var. *pumila*. — In this the sepals are pale yellow, without spots or markings, and the petals are of the same colour, but tinged with purple near the base.

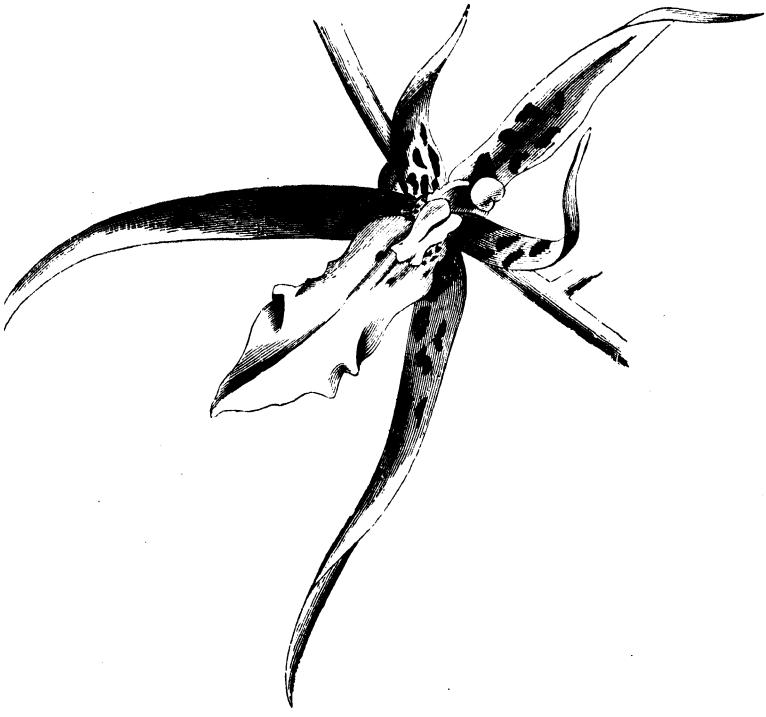


FIG. 20.—FLOWER OF BRASSIA LANCEANA
(⅓ nat. size).

B. Lawrenceana (*Lindl.*).—Though often confounded with *B. Lanceana*, this is, nevertheless, quite distinct. The flowers are large and sweet-scented, the sepals and petals bright yellow, spotted with cinnamon-brown and green; the lip is also yellow, tinged with green. It flowers in spring or summer, and lasts for

Brassia.

a long time in full beauty. Introduced from Brazil in 1839. (B. R., 1841, t. 18.)

Var. *longissima* (*Rchb. f.*) has a many-flowered scape, nearly 2ft. in length. The sepals are deep orange-yellow, blotched and spotted with reddish-purple, and as much as 7in. in length. The lip is about 3in. in length, pale yellow, dotted and spotted towards the base with purple. It is a magnificent variety, and flowers during August and September. Costa Rica, 1867. (B. M., t. 5748.)

B. maculata (*R. Br.*).—One of the earliest exotic Orchids that flowered in Britain, having been introduced in 1806, and figured in the "Botanical Register" in 1814, from a plant which flowered at Kew. The sepals and petals are pale yellow, irregularly spotted with brown, the former being short compared with those of other species; the lip is large and spoon-shaped, white, spotted about the centre with brown and purple. Its flowers, which are somewhat showy, are produced during spring and early summer. It is a native of Jamaica. (Fig. 21; B. R., t. 1691.)

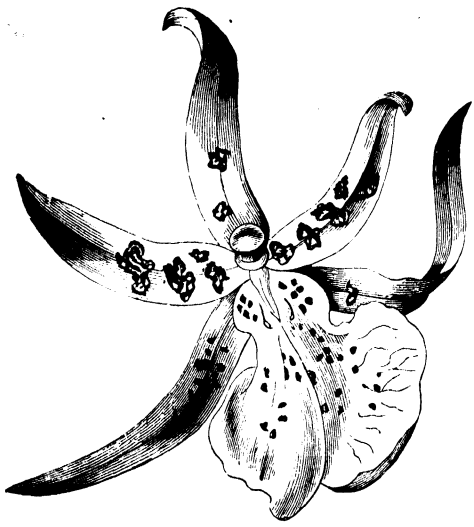


FIG. 21. FLOWER OF BRASSIA MACULATA (nat. size).

Var. *guttata*.—This is in cultivation under the name of *B. Wrayæ*. It has greenish flowers, spotted with purplish-brown throughout. The blossoms vary a good deal in size in different examples. Native of Guatemala. (B. M., t. 4003.)

B. verrucosa (*Lindl.*).—A robust plant, with large, deep green foliage; the scape is many-flowered, the blossoms being large, with greenish-white sepals and petals, which are blotched with blackish purple. The lip is white, ornamented with numerous little green protuberances, or warts, from which the

species takes its name. It is a showy plant, and an abundant bloomer, the flowers appearing in May and June. Introduced from Guatemala in 1838. (Batem. Orc., t. 22.)

The best variety is that known as *grandiflora*, the flowers of which are larger than in the type.

B. Wrayæ (*Hook.*).—A synonym of *B. maculata guttata.*

BRASSO-CATTLEYA.

By this name are known hybrids derived from the intercrossing of *Brassavola* and *Cattleya.* They require the same cultural conditions as *Cattleya.*

B.-C. Lindleyana = *B. tuberculata* × *C. intermedia* (nat. hyb.)
B.-C. nivalis = *B. fragrans* × *C. intermedia* (Leeman).

BRASSO-CATT.-LÆLIA.

A name given to a hybrid produced from the intercrossing of *Brasso-Cattleya* and *Lælio-Cattleya.* It requires intermediate-house treatment.

B.-C.-L. Lindleyano-elegans = *B. C. Lindleyana* × *L. C. elegans* (Lawrence).

BROMHEADIA.

Dr. Lindley gave the name to this small genus of stove Orchids, of the tribe *Vandeæ*, which is in compliment to Sir Edward Finch Bromhead. The plants require East Indian-house treatment. The potting compost should consist of equal portions fibrous peat and sphagnum.

B. palustris (*Lindl.*) is the only species in cultivation. The flowers are large, sweetly scented, opening in the early morning and very soon closing; sepals pure white, or tinged with pink, 1½in. long; petals pure white; lip white, veined with violet-pink; racemes about 3in. long. Leaves spreading, rather distant below, and gradually passing into sheaths at the top of the otherwise bare stem. Introduced from Malaya in 1840. (B. M., t. 4001.)

BROUGHTONIA.

A very compact-growing evergreen Orchid, of the tribe *Epidendreæ*, closely allied to *Lælia*, and named after

Broughtonia.

Mr. Arthur Broughton, an English botanist. It requires intermediate-house treatment, and does best grown in baskets or on blocks of wood, with a little peat and moss placed amongst the roots. A fairly humid position at all seasons should be assigned it, but when in active growth it requires an abundance of water and a bright light, only sufficient shade being provided to protect the foliage from scorching. This genus now includes *Læliopsis*.

B. sanguinea (*R. Br.*).—Flowers blood-coloured, rather large, disposed in a terminal panicle; scape divided; column distinct, or at the very base united with the unguiculate lip, which is lengthened at the base into a tube, connate with the ovarium. Leaves twin, oblong, seated on a pseudo-bulb. Jamaica, 1793. (B. M., t. 3076.)

BROWNLEEA.

Three species of greenhouse terrestrial Orchids, of the tribe *Ophrydeæ*, natives of South Africa, make up this genus. They are closely allied to *Disa*, but have a very small upturned lip, and an erect, concave, or helmet-shaped odd sepal without a spur. Only one species has been known to cultivation, and this requires similar treatment to *Disa*. Harvey stands sponsor for the name, which is in honour of the Rev. J. Brownlee, a missionary stationed in King William's Town, Caffraria.

B. cærulea (*Harv.*).—Flowers pale blue, with violet dots and a long, straight spur; spikes erect, lax, many-flowered. Leaves, two or three, sessile or shortly petiolate, ovate or lanceolate, acuminate, three-ribbed. Stems erect, annual, springing from an amorphous, lobed tuber. Introduced 1893. (B. M., t. 7309.)

BULBOPHYLLUM.

Few of the species of the genus *Bulbophyllum* (*Thou.*), of the tribe *Epidendreæ*, find favour with Orchid-growers. Those here described are in cultivation, and are either pretty or deserving of notice on account of the singular structure of their flowers. The rhizome is stout and creeping, and usually the pseudo-bulbs are small and roundish, bearing one or two stiff, leathery leaves on the top, and thus giving rise to the generic name (from *bulbos*,

Bulbophyllum.

a bulb, and *phyllon*, a leaf). The flowers are chiefly remarkable in the lip, which is jointed and movable, a very slight touch being sufficient to produce an oscillatory motion. In some instances a dense tuft of hairs occurs at the point of the lip and other segments, and here the movement is started by the slightest breath of air. The genus is also interesting as containing, on the one hand, one of the most gigantic of Orchids—*B. Beccarii*—and, on the other, one of the most minute—*B. pygmæum*, a native of New Zealand.



FIG. 22. BULBOPHYLLUM BARBIGERUM
(⅓ nat. size).

Culture.—The species enumerated below are all natives of the tropics, and require a warm, moist atmosphere when growing; even when at rest it is not advisable to allow them to become quite dry. The dwarf-growing section does best in shallow pans or baskets, suspended near the roof-glass, the compost consisting of equal parts fibrous peat and sphagnum, pressed moderately firm.

A paper read by Mr. W. H. White, at one of the meetings of the Royal Horticultural Society, and since published in the "Journal," gives some interesting matter in respect of this peculiar and beautiful class of plants. They should be more extensively cultivated.

Bulbophyllum.

B. anceps (*Rolfe*).—Flowers of moderate size; dorsal sepal and petals yellowish, dotted with purple; lateral sepals white, striped with purple; lip purple; racemes lax. Leaves oblong, obtuse. Pseudo-bulbs very broad, compressed. Borneo, 1892. An elegant species. (Lindenia, viii., t. 351.)

B. barbigerum (*Lindl.*).—An interesting little plant, with pseudo-bulbs less than 1in. in diameter, bearing one oblong, fleshy leaf. The flower-spike springs from the base of the pseudo-bulb and carries eight to twelve flowers. The sepals are pointed, and of a chocolate-brown colour; the petals small and inconspicuous; and the lip, which is long and narrow, is of a yellowish tint, terminating in a brush of dark purple silk-like hairs. The lip is set in a rocking motion by the least current of air. Sierra Leone, 1836. (Fig. 22; B. M., t. 5288.)

B. Beccarii (*Rchb. f.*).—This is one of the most extraordinary members, not only of the Orchid family, but of the whole Vegetable Kingdom. Its flowers have the reputation of giving off the vilest odour of any known plant. It is a gigantic Orchid, with rhizomes big enough to encircle the large trees on which it grows—resembling, it is said, the coils of a serpent. The leaf is the largest of any of the *Orchideæ*, measuring 2ft. in length by 1½ft. in breadth; it is also very thick and leathery. The flowers, which are produced in dense, pendulous racemes, measure ¾in. in diameter. They are of a light brown, painted with violet, the lip being brown, with a violet hue, while the peduncles are rosy, with violet lines. When this plant was first flowered at Kew, some years ago, the stench from the flowers was so powerful as to render the Orchid-house unbearable, and a lady who attempted to make a drawing of the plant fainted because of the smell. Originally found by Thomas Lobb in Borneo in 1853, and again by Doctor Beccari, in 1867. (B. M., t. 6567.)

B. calamarium (*Lindl.*).—A pretty little plant, with short, dark green, leathery leaves, roundish pseudo-bulbs, and a slender scape 1ft. to 1½ft. high, bearing a spike of yellow and purple flowers 4in. long; the lip is deeply and elegantly fringed. Sierra Leone, 1843. (B. M., t. 4088.)

B. Dayanum (*Rchb. f.*).—Flowers 1in. in diameter, ciliated with long hairs; sepals greenish, with purple streaks; petals blood-red, with yellow margins; lip green, with red ridges on the disk; scape wanting, leaves 3in. long, elliptic, reddish beneath. Pseudo-bulbs 1in. long, crowded. Tenasserim, 1865. (B. M., t. 6119.)

B. Dearei (*Rchb. f.*).—This is probably the handsomest of the genus, having large, showy flowers, 3in. in width. The

Bulbophyllum.

pseudo-bulbs are clustered, about 1in. in diameter, and bear a solitary, oval leaf, 4in. to 6in. long. The prevailing colour of the flower is a tawny yellow, with dark reticulating veins, and spotted with purple. The triangular lip is jointed and flexible, and is rendered conspicuous by a horseshoe-shaped crest. Borneo and Philippines, 1883. Syn. *Sarcopodium Dearei.*

B. grandiflorum (*Blume*).—Flowers solitary, large, densely-reticulated with brown on a pale ground; sepals lanceolate, attenuate, 4in. to 5in. long, free, the upper one twice as broad as the lateral ones, strongly arching over at the base, and hanging down in front; leaves solitary, elliptic, 2½in. to 3in. long. Pseudo-bulbs about 1in. long, distinct, four-angled. Rhizome creeping. New Guinea, 1887. (Lindenia, iii., t. 108.)

B. lemniscatum (*Parish*).—One of the most singularly beautiful of small-flowered Orchids. It has small, warty pseudo-bulbs, and erect, slender scapes, bearing at the apex a recurved spike of purple flowers of very curious structure. Each of the sepals bears a relatively long, club-shaped appendage, attached by a hair-like point, so that it moves very easily. Under a magnifying lens these flowers are exceedingly interesting. Moulmein, 1870. (B. M., t. 5961.)

B. Lobbii (*Lindl.*).—A desirable species, somewhat resembling *B. Dearei.* It has flowers 3in. to 4in. in diameter, produced singly, on slender stalks, 4in. long, from the base of the one-leaved pseudo-bulbs. The leaf is oblong, and about 6in. in length. The spreading sepals and petals are of a deep, tawny yellow, the upper sepal being spotted at the back with purple; the lip is reflexed, and, like the broad, short column, is yellow, spotted with purple. It flowers in June. A native of Java, Moulmein, &c.; introduced in 1846. Syns. *Sarcopodium Henshalli, S. Lobbii.* (B. M., t. 4532.)

Var. *siamense* has leaves longer and more leathery than the type, and its lemon-coloured flowers are marked with veins and spots of reddish-crimson.

BURLINGTONIA.

According to Bentham and Hooker this is now relegated to **Rodriguezia.**

CALADENIA.

Belonging to the genus *Caladenia* (*R. Br.*), we have some pretty greenhouse, terrestrial Orchids of the tribe

Caladenia.

Neottieæ, natives of New Zealand and Australia. The generic name is derived from *kalos*, beautiful, and *aden* a gland, and is in reference to the disk of the labellum being beset with glands. Flowers few, loosely racemose or solitary, often erect, pedicellate; bracts small; sepals subequal, free, narrow; petals narrow, erect or spreading. The species should be grown in a cool greenhouse. When growing, they require careful watering, and during the dormant state only sufficient moisture should be afforded to maintain the pseudo-bulbs in a normal plump state. They require a compost consisting of peat, loam, and rough sand in about equal proportions. There are about thirty species enumerated, but probably none are seen in cultivation outside botanic gardens, where the species usually found is *C. Patersoni* (*R. Br.*) and its variety *dilatata*.

CALANTHE.

Numerous very handsome species of the genus *Calanthe* (*R. Br.*) are in cultivation. They belong to the *Epidendreæ*. The generic name has been well bestowed, and is from *kalos*, beautiful, and *anthos*, a flower. Most of them are robust-growing, terrestrial plants, producing large, broad, many-ribbed or plaited leaves, which are evergreen or deciduous; the racemes are long, bearing many flowers, and these are distinguished by their spurred lip, which is attached to the column, and by the eight thick, waxy pollen-masses adhering to a separate gland. About forty species are known, chiefly natives of Asia, a few being American.

The deciduous section of Calanthes deserve to be special favourites with amateurs, because, in the first place, they produce an abundance of showy flowers, which last a long time in full beauty; and, secondly, they are, as a rule, so easily managed that anyone possessing a stove may grow them successfully, and may be sure of an abundance of bloom.

We doubt if there are any more popular Orchids in cultivation than this section of Calanthes, for we find them extensively grown in almost every garden where there is a demand for flowers at the dullest season

Calanthe.

of the year. The different varieties of *C. vestita* and the hybrids of the *C. Veitchii* section are those principally found.

The evergreen Calanthes are more interesting as botanical plants, and are not extensively cultivated. They require stove treatment where the atmospheric conditions can be retained in a humid state for the greater portion of the year. The compost should consist of two parts fibrous peat to one of sphagnum, with sufficient rough sand to keep the whole porous. Liberal drainage should also be afforded.

For the deciduous section the bulbs should be re-potted in February or March. The best results are got from plants grown singly. Turfy loam, with leaf-soil, dried cow-manure, and a sprinkling of sand and sphagnum, forms a good mixture, and the pots should be one-quarter filled with drainage. Plant the bulbs on the top of the soil, so that the new growth is not buried; press the soil firmly, and leave about ½in. of space for water. Give no water till the new roots have penetrated into the soil, and then water carefully until the fresh growth is well away, when a liberal supply at the roots, on the leaves, and in the atmosphere is necessary. The best position for the plants all through the summer is close to the glass, on the lightest side of a moist stove. When the new bulbs are approaching full size, weak liquid manure may be given weekly. Do not dry the plants off till after the flowers are over. By careful management some of the foliage may be got to remain on the plants till they flower. When in bloom, a dry, warm house is most favourable to the duration of the flowers. If started in small pots, the plants must be removed into larger ones as the soil fills with roots. The size and strength of the inflorescence are regulated by those of the pseudo-bulbs. These plants may be multiplied by divisions of the pseudo-bulbs, placing them on sandy soil, in a moist hothouse or a frame, until they show signs of growing. During the resting season the plants should be placed on a shelf in a warm house, where they will obtain sufficient moisture from the atmosphere to sustain them until the re-potting season returns. The flowers are amongst the most useful for cutting for decorative work of all kinds. In the neighbourhood of

Calanthe.

London, the flowers of this and other allied Calanthes are much damaged by foggy weather.

C. bicolor (*Lindl.*).—A synonym of *C. striata.*

C. Masuca (*Lindl.*). A bold-growing, evergreen plant, with large, many-ribbed, dark green leaves, and stout, erect flower-spikes, 2ft. or more high. The flowers are spreading, 1in.



FIG. 23. CALANTHE VERATRIFOLIA, SHOWING HABIT (much reduced).

across, the segments overlapping; they are very numerous, with deep violet sepals and petals, which change into lilac with age, whilst the lip is of an intense violet-purple. This species commences to bloom during early summer, and continues until autumn; it is almost always to be found with a few spikes of flowers upon it. Native of Northern India, whence it was introduced about 1842. (B. M., t. 4541.)

Calanthe.

C. Sieboldii (*Maxim.*).—A synonym of *C. striata.*

C. striata (*R. Br.*).—A Japanese species, sometimes grown under the names of *C. bicolor* and *C. Sieboldii.* Flowers in a loose raceme; sepals and petals are oblong, acute, yellow outside and brownish within; lip light yellow, deeply three-lobed, the middle lobe being again shortly bilobed and having three ridges that are raised into tubercles at their apex and near their base; stem 18in. high. Leaves broadly lanceolate, acute, 6in. to 10in. long. Introduced in 1888. (B. M., t. 7026.)

C. veratrifolia (*R. Br.*).—In general appearance this plant resembles *C. Masuca,* producing bold, dark green, evergreen leaves, 2ft. long, and erect, many-flowered spikes, which in strong plants attain a length of 3ft. The individual flowers are not large, but they are very numerous, crowding the upper part of the scape; they are pure white. They are developed in spring and early summer, and if not wetted, last long in beauty. Although an old introduction, this species is still frequently shown among exhibition collections of Orchids. It is a native of India, Australia, &c. (Fig. 23; B. M., t. 2615.)

C. vestita (*Wall.*).—One of the most popular of all Orchids, and one of the oldest favourites. It is grown in every garden where stove plants are cultivated, and is frequently the only Orchid represented. It was introduced in 1848 by Messrs. Veitch and Sons, since which time it has been considerably improved by cultivation and selection, and has also been useful for hybridisation purposes. The type has apple-shaped pseudo-bulbs; large, plaited, bright green leaves; and a basal flower-spike, from 1ft. to 3ft. long, sometimes branching. Each flower is about 2in. across; sepals and petals are similar, spreading; lip large, divided into four lobes, pure white, with a yellow blotch in the throat. Flowering time, early winter. Native of Moulmein. (B. M., t. 4671.)



FIG. 24. FLOWERS OF CALANTHE VESTITA GIGANTEA

(⅓ nat. size).

Calanthe.

There are numerous named varieties, the best of which are:

Var. *Fournieri*, with flowers smaller than the type.

Var. *gigantea.*—Larger in all its parts; spike very stout; flowers large, white, with a blood-red eye. This retains its foliage till new growth begins, and flowers from November to March. (Fig. 24.)

Var. *nivalis.*—Flowers pure white.

Var. *porphyrea.*—Flowers wholly blood-crimson, with a deeper-coloured eye

Var. *Regnierii.*—Spike compact; flowers tinged all over with rose, differing slightly in form from the type.

Var. *rubro-oculata.*—Flowers large, with a crimson blotch instead of yellow, in the throat.

Var. *Turnerii.*—Flowers more compact on the spike, smaller than in the type; throat blotched with rose-red.

The following are hybrids:—

Albata *veratrifolia* and *Cooksonii* (Sander).
Alexanderi *vestita rubro-oculata* and *Veitchii* (Cookson).
atro-rubens *William Murray* and *Oakwood Ruby* (Cookson).
Aurora *Regnierii* and *rosea.*
Barberiana *vestita and Turnerii* (Barber).
Baron Schræder *vestita rubro-oculata gigantea* and *Regnierii* (Schrœder).
bella *Turnerii* and *Veitchii* (Veitch).
Bryan *vestita rubro-oculata* and *Williamsii* (Cookson).
burfordiense *vestita* and *Veitchii* (Lawrence).
cesta *vestita nivalis* and *vestita* (Lawrence).
Cooksonii *Veitchii* and *vestita luteo-oculata* (Cookson).
Darblayana *Regnierii* and *vestita gigantea* (D'Arblay).
Dominii *Masuca* and *furcata* (Veitch).
Eclipse *vestita Regnierii* and *veratrifolia.*
Exquisite *vestita luteo-oculata* and *vestita Turnerii.*
Eyermanii *vestita and Veitchii.*
Florence *bella* and *Veitchii* (Wilshere).
gigas *Sanderiana* and *vestita rubro-oculata gigantea* (Veitch).
Hallii *Veitchii* and *vestita rubro-oculata* (Hall).
Harold *vestita rubro-oculata* and *Veitchii* (Cookson).
Harrisii *Turnerii* and *Veitchii* (Veitch and Bennett-Poe).
labrosior unrecorded (Lawrence).
Laucheana *Sanderiana and veratrifolia.*
lentiginosa *labrosa and Veitchii.*
Masuco-tricarinata *Masuca* and *tricarinata* (Veitch).
Moorei unrecorded (Moore).
Mylesii *nivalis* and *Veitchii* (Williams).
Novelty *veratrifolia* and *Cooksonii.*
Oakwood Ruby *vestita rubro-oculata* and *rosea* (Cookson).
Oweniana *Veitchii* and *nivea.*
Phœbe *Veitchii* and *vestita Turnerii.*

Calanthe.

porphyrea*labrosior* and *vestita rubro-oculata* (Lawrence).
revertens unrecorded (Lawrence),
Rollinsoni*veratrifolia* and *Masuca*.
Sandhurstiana*rosea* and *vestita rubro-oculata* (Lawrence).
sanguinaria.....*vestita* and *Veitchii* (Lawrence).
Sedenii.....*Veitchii* and *vestita rubro-oculata* (Veitch).
Sibyl.....*vestita rubro-oculata* and *rosea* (Cookson).
splendens*rosea* and *Bryan* (Cookson).

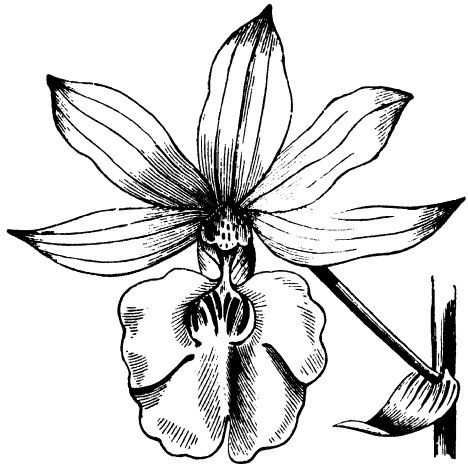


FIG. 25. FLOWER OF CALANTHE VEITCHII
(nat. size).

Veitchii (Fig. 25)*rosea* and *vestita* (Veitch).
versicolor.....unrecorded (Lawrence).
Victoria Regina.....*Veitchii* and *rosea* (Sander).
William Murray*vestita rubro-oculata* and *Williamsii* (Cookson).

CALOPOGON.

Very pretty, hardy, tuberous-rooted Orchids, of the tribe *Neottieæ*. The name *Calopogon* (*R. Br.*) is from *kalos*, beautiful, and *pogon*, a beard, and is in allusion to the fringed lip. The species are suited for a good shady position at the foot of a rockery, or for an open situation in a hardy fernery. Perhaps the only species in cultivation is

C. pulchellus (*R. Br.*).—Flowers purple, with a very pale yellow beard, or tuft of hairs, growing from the lip; two or

Calopogon.

three to a plant. Leaves few, radical, grass-like. Height 1½ft. North America, 1791. Syn. *Limodorum tuberosum.* (S. B. F. G., t. 115.)

CALYPSO.

Salisbury bestowed the above name upon this monotypic genus after that of the Greek goddess, the species being an elegant terrestrial Orchid of the tribe *Epidendreæ.* It thrives well in half-shady spots on the margins of rock-gardens or as a bog-plant, in a soil composed of peat, leaf-mould, and sand. It should be thickly covered with cocoa-nut fibre refuse during winter.

C. borealis (*Salisb.*).—Flowers solitary, delicate rose and brown, with yellow crest on the lip; labellum longer than the sepals, the lateral lobes cohering in their upper parts over the saccate central one, which is usually bifid at the lip, resembling those of *Cypripedium.* Leaves solitary, thin, many-nerved, ovate or cordate. Stems usually thickening into pseudo-bulbs. Northern Hemisphere, 1820. (B. M., t. 2763.)

CAMARIDIUM.

About a dozen species of stove, epiphytal Orchids, natives of tropical America, are included in the genus *Camaridium* (*Lindl.*), of the tribe *Vandeæ.* The name is derived from *kamara,* meaning an arched roof, and is in allusion to the arched tip of the stigma. Flowers mediocre, solitary, produced from the axils of the distichous leaves. The species require an intermediate-house temperature.

C. Lawrenceanum (*Hort.*).—Sepals and petals yellowish-white, the former spotted with reddish-purple, most distinctly on the back; lip deep, dark purple, yellowish-white at the apex, ⅓in. long; column yellowish-white, with a purple stigma; peduncles axillary, one-flowered. Leaves 1½in. to 3in. long, linear obtuse. Pseudo-bulbs 1in. long, elliptic-oblong, compressed, two-leaved at the apex. Introduced in 1894.

C. ochroleucum (*Lindl.*).—Flowers yellowish-white, produced in July. Leaves ligulate. Pseudo-bulbs oblong, compressed, smooth. Height 12in. Trinidad, 1823. Syn. *Cymbidium ochroleucum.* (B. M., t. 4141.)

CATASETUM.

Although, with one or two exceptions, the flowers of *Catasetum* (*Rich.*) are not beautiful, yet their quaint appearance and remarkable structure, together with the power they have of ejecting the pollen-masses when either of the horns attached to the column is touched, render them objects of greater interest to many than even their most showy allies. It is from the position of these two horns that the genus derives its name—from *kata*, downward, and *seta*, a bristle. The genus, which belongs to the *Vandeæ*, and is an extensive one, deserves much more attention from Orchid-cultivators than it has hitherto received. The pseudo-bulbs are, in most instances, short and stem-like, bearing four or five plaited leaves, with stout, membranous veins. The flowers are borne on erect or drooping racemes, and are usually green, yellow, and brown, with sepals and petals of a firm, leathery texture. Occasionally flowers of different sexes are produced on the same pseudo-bulb.

Culture.—Catasetums are not difficult to grow, the essential points to be observed being abundance of heat and moisture during active growth, and afterwards a well-marked period of rest. They succeed in either pots or baskets, in a compost of fibry peat, chopped sphagnum, and silver-sand. Water must not be given until growth has fairly commenced, and at all times it must be prevented from lodging in the centres of the growths. Catasetums require a greater amount of light than most Orchids, and are well suited if grown along with tropical Dendrobiums. When the leaves begin to drop off, the plants should be removed to an airy position in an intermediate temperature, only sufficient water being then given to prevent the shrivelling of the pseudo-bulbs

The enumeration given below is only a selection from the sixty species known; but it represents the best of those introduced.

C. Bungerothii (*N. E. Br.*).—This species is by far the finest of those introduced. The pseudo-bulbs are 8in. to 12in. high, and taper towards the top; the leaves are of a greyish tint, and have several prominent parallel nerves or ribs. The flowers are greenish or cream-white at first, finally becoming a beautiful ivory-white; they measure 2½in. across. The sepals are

lance-shaped, and pointed, the upper one, with the two petals, forming a kind of hood above the column. The lip is broad, and spoon-shaped, with a depression or pit in the centre, and finely serrated at the edge. Introduced from Tropical America in 1882. (B. M., t. 6998.) Syn. *Coryanthes Bungerothii.* There is a form with narrow light red sepals, broad, long, acute, white petals, and a white lip. This is known as *C. pileatum.*

C. Christyanum (*Rchb. f.*).—A curious species, with stout, tapering pseudo-bulbs, and long, plaited leaves. The flower-spike is erect, bearing six to twelve flowers, which are developed during September and October. The sepals and petals are of a dull chocolate-brown, and the lip is bright green, shaded with purple. Native of Brazil. (W. O. A., t. 83.)

C. Garnettianum (*Rolfe*).—This is allied to *C. barbatum* (*Lindl.*), but smaller. Flowers about 1½in. in diameter; sepals and petals lanceolate-linear, 1oin. long, acute, light green, densely spotted with dark brown; lip white, ¾in. long, linear, divided into bristles at the apex, and with shorter bristles on the margin below; scape erect, several-flowered. Leaves lanceolate, 4in. long. Pseudo-bulbs 1in. to 2in. long, compressed-ovate or conical. Brazil, 1888. (B. M., t. 7069.)

C. longifolium (*Lindl.*).—A most remarkable Orchid, found growing on the top of a species of palm in British Guiana. The pseudo-bulbs are stout and grey, and they have the curious habit of growing downwards. The leaves are narrow and glaucous, attaining a length of from 1ft. to 4ft. The flowers are densely produced on pendent spikes, having sepals and petals of a dull red colour, and a helmet-shaped lip of brownish lake, thickly dotted with yellow; they are about 1½in. in diameter, and produced in autumn. This species was discovered by Sir R. Schomburgk, in 1836, and flowered first in this country three years later. When growing it requires very hot and moist treatment. Syn. *Monacanthus longifolius.* (B. M., t. 3819.)

C. macrocarpum (*Rich.*).—One of the most easily-grown, and, at the same time, one of the most striking of Catasetums. The pseudo-bulbs are 1ft. in length, and the flowers 3in. to 4in. in diameter. The broad, stiff sepals and petals have a ground-colour of pale yellowish-green, marked with numerous spots of purplish-brown. The helmet-shaped, very fleshy lip is of a deep orange-yellow, spotted with brown. Several varieties of this plant are in cultivation, including *bellum*, with brown-purple petals and a large purple-brown blotch on each side. Syn. *C. tridentatum.* (B. M., tt. 2259, 3329.)

C. pileatum (*Rchb. f.*).—A synonym of *C. Bungerothii.*

Catasetum.

C. Randii (*Rolfe*).—This differs from *C. Garnettianum* in having the lip furnished with a short, broad, brush-like appendage. Brazil, 1894. (B. M., t. 7470.)

C. saccatum (*Lindl.*).—A large-flowered and interesting species, remarkable for its pouched lip. In the form of its pseudo-bulbs and foliage it resembles *C. macrocarpum.* The flower-scape is stout, curved, and bears several flowers; the sepals and petals are green, spotted with purple; the lip is bright yellow, with crimson spots, having a small hole in the centre leading into the chamber or sac beneath. The plant flowers in March, and is a native of Demerara, whence it was introduced in 1840.

C. Scurra (*Rchb. f.*).—A more compact species than any of the preceding, with pseudo-bulbs about 1½in. high, and bright green leaves, 6in. long. The flowers are delightfully scented, and are of a yellowish-white, with green veins. The curiously-shaped lip is three-lobed, the side lobes standing erect on each side of the column; the middle lobe consists of a short, broad stalk, developing into two lateral horns, with toothed edges. Introduced from Demerara in 1872. (G. C., n.s., vii., p. 304.)

C. tridentatum (*Hook.*).—A synonym of *C. macrocarpum.*

CATTLEYA.

In 1824 Dr. Lindley founded this magnificent genus upon *Cattleya labiata*, and it was named by him in honour of Mr. William Cattley, a celebrated horticulturist, who had then the finest collection of Orchids known. It belongs to the tribe *Epidendreæ.*

"The Cattleyas have a horticultural importance that is scarcely equalled by any other branch of the great Orchidean family. This pre-eminence is due to the surprising beauty of the flowers of nearly all the species and varieties, which are not only of large size, but are also adorned with a wonderful variety of the most delicate and pleasing tints. Especially striking is the labellum, or lip, which is remarkable for the extreme richness of colour often developed in its anterior lobe, and for the beauty of the pencillings and markings in the throat" (Veitch).

The characters by which *Cattleya* is distinguished are: Sepals free to the base, and nearly equal in size; petals broader than the sepals; lip large, folded at the base into a tube inclosing the column, the other portion spreading,

Cattleya.

and very variable in colour and form in different species; column long, thick, with a toothed top, covering a two-celled, globose anther-case; pollen-masses in two pairs.

The only difference between this genus and *Lælia* is that in the latter there are four pairs of pollen-masses —termed *pollinia*—instead of two. In all other characters the two genera are identical. The rhizome is strong and woody, creeping, and bearing at intervals the stems, or pseudo-bulbs. The leaves are apical, and sometimes in pairs, usually solitary; they are leathery in texture, and remain on the plant several years. Generally, each branch of the rhizome produces only one new pseudo-bulb annually. The flowers are developed on short, stout spikes, from the top of the pseudo-bulb, and are at first inclosed in a sheath. When in good health, each pseudo-bulb will produce a spike of flowers, which last a considerable time before fading. Many Cattleyas are plentiful enough to be obtained at little cost, and they are not difficult to cultivate when once understood. In a word, they are gorgeously beautiful, and are essentially Orchids for amateurs and for cut-flower purposes. The various members of this genus are natives of Colombia, Brazil, and Central America, and are entirely confined to the Western Hemisphere. They vary considerably in size; for whilst some have pseudo-bulbs only 2in. or 3in. long, others reach as many feet in height, forming, in a state of nature, huge masses, sometimes several yards in diameter. In addition to true species and varieties, we have now many Cattleyas which have been produced in this country by hybridising, and these, for both size of flower and beauty of markings, vie with the choicest of the introduced species and varieties.

With reference to the conditions under which Cattleyas are found growing in a state of nature, M. Van Volxem says: "Cattleyas grow generally from 5ft. to 15ft. above the ground, commencing on the forks of thick trees, whence they extend to the branches, preferring those that are more horizontal than vertical. Between and around the bulbs rich vegetable mould accumulates, in which they luxuriate. Sometimes, however, I found them growing on the small lateral asperities of bare rocks, in the full blaze of the sun; but in this position they were of a very

stunted growth, although flowering freely." This stunted growth also occurs when plants are found growing at a high altitude.

Of late years the reintroduction of the old autumn-flowering *C. labiata* in such quantities that they are placed well within the reach of all, has had considerable effect on the culture of the *Cattleya* family. The whole of the species now are general favourites, and are extensively cultivated, providing a succession of flowers through the greater part of the year.

Culture.—Pot or basket culture for the bulk of the kinds will be best, as they will not only in this manner produce the finest blossoms, but will require less constant attention at the hands of the cultivator. For potting material, use good fibrous peat from which all the fine soil has been well beaten; add to this some chopped living sphagnum and some clean and sharp silver-sand. Fill the pots at least two-thirds with drainage, and in potting let the rhizome sit upon the top of the soil, which should be mounded somewhat above the rim of the pot, towards the base of the plant in the centre. A few stakes should be affixed to which the pseudo-bulbs can be secured. Very much depends upon the amount of water given at different seasons. Cattleyas like an abundant supply of moisture during the growing season, and a nice, genial, moist atmosphere. The water should be given from a watering-can. In the case of those kinds which are suspended from the roof in baskets or upon blocks of wood, there is less to fear from the syringe, so long as the water is not allowed to stand in the large, sheathing scales that envelop the young growths and flower-scapes. This, however, may easily occur with careless or indiscriminate syringing, and often proves fatal to young pseudo-bulbs. The syringe should not be depended upon entirely for supplying moisture to plants grown upon blocks, but during summer they should be examined once a day, and, if at all dry, should be immersed in a tub or a pan of water, which should at least be of the same temperature as the house they are growing in. After the pseudo-bulbs are formed, water must be withheld, and the plants allowed a season of rest; but care should be taken to prevent their becoming very dry during this period, as much injury

may arise from entirely withholding water for any length of time.

If a house can be set apart for Cattleyas, it will be found that the majority of the kinds may be accommodated in it. The temperature should range from 55deg. in winter to 70deg. in summer, although in bright, warm weather, the latter temperature is often necessarily exceeded with safety. Ventilation should be carefully attended to, as Cattleyas cannot bear a stuffy atmosphere at any time. With respect to shading, it may be said that as little as possible should be used; only in bright sunshine should the blinds be down, and these should be of the thinnest material. Sudden changes of temperature should be avoided. Partly decayed leaves as a substitute for peat have come greatly into vogue, and they are extensively used on the Continent, and by some cultivators in England. The leaf-soil should be pressed moderately firm, and the surface covered with freshly-chopped sphagnum. While satisfactory results are obtained by this system on the Continent, so much moisture is retained that considerable care has to be given in the application of water. Even with such careful treatment, the writer's experience does not tend to recommend its adoption in the neighbourhood of towns and in smoky districts. Except where otherwise stated, the Cattleyas enumerated require the above temperature.

The following are now classed by botanists as varieties of *C. labiata: Dowiana, Eldorado, Luddemanniana, Mendelii, Mossiæ, Percivaliana, Trianæi, Warneri,* and *Warscewiczii* (*gigas*); but we think the purpose of this work will be best met by treating each as distinct species.

C. Aclandiæ (*Lindl.*).—A lovely, dwarf-growing species, which should be grown upon a block of soft wood, or in a teak basket, and placed at the warm end of the Cattleya-house or stove, where it can receive full light all the day through. When growing, it should be kept constantly moist at the root. If grown in baskets, very little potting material should be used. The pseudo-bulbs are slender, and usually from 5in. to 6in. long, bearing two oval, leathery, dark green leaves, 3in. long, and usually a pair of handsome flowers. These are large for the size of the plant, and vary somewhat in colour in different examples. They are about 4in. in diameter, the sepals and petals similar, chocolate-brown, barred with irregular,

transverse bands and streaks of yellow; the lip is large and spreading, varying from rich rose to almost deep purple. This charming plant produces its flowers in May, June, and July; it will sometimes mature bulbs, each bearing two flowers, at short intervals throughout the season. It is easily distinguished by the base of the lip being too narrow and too spreading to cover the column. Brazil, 1839. (B. M., t. 5039.)



FIG. 26. FLOWER OF CATTLEYA BICOLOR
(nat. size).

C. Alexandræ (*L. Lind.*).—A synonym of *C. elongata.*

C. amethystina (*Morr.*).—A synonym of *C. intermedia.*

C. amethystoglossa (*Rchb. f.*).—A synonym of *C. guttata Prinzii.*

Cattleya.

C. aurea (*Lind.*).—See *C. Dowiana aurea.*

C. bicolor (*Lindl.*).—The entire absence of the lateral lobes of the lip (which usually enfold the column in this genus) gives this species a most remarkable appearance. The stems are slender, from 2ft. to 3ft. high, jointed, two-leaved. The leaves are oblong, and 6in. in length. Peduncles bearing from three to five flowers, each of which is about 4in. across; the sepals and petals are fleshy, and of a peculiar brownish hue; the labellum is long and narrow, of a crimson-purple colour, paler towards the margin. It was introduced in 1837 from Brazil, where it grows in large tufts, at a great elevation, on the trunks of the largest trees. It blossoms from August to October. (Fig. 26; B. M., t. 4909.)

C. Bowringiana (*Veitch*).—In habit this resembles *C. Skinneri*, but is stouter in the stem and longer in the leaf than that species. The flowers are produced from five to ten together on a scape; they are very similar to those of *C. Skinneri*, usually less than 3in. across, the petals as wide again as the sepals, and the lip overlapping at the sides, so as to form a funnel, slightly prolonged on the lower side. The colour is rose-purple, with veins of a deeper tint, the lip being deep purple, paler at the margin, white in the throat. This species has become a popular garden plant, as it grows and flowers freely under ordinary treatment, and its flowers are pretty. It has proved a most useful plant for hybridising purposes. It requires plenty of moisture whilst growing, and should not be allowed to get too dry even when at rest. Its flowers are developed in October and November. British Honduras, 1884.

C. bulbosa (*Lindl.*).—A synonym of *C. Walkeriana.*

C. chocoënsis (*André*).—Under this name we have a winter-blooming species of much value. The flowers vary much in the depth and intensity of their markings, but all are extremely beautiful; in general habit of growth the plants resemble *C. Trianæi.* The flowers usually have broad, pure white sepals and petals, more or less fringed at the edges; but in some varieties these are blush, and even deep rose in colour. The lip is yellow, stained more or less profusely with rich purple. The flowers are exceptionally fragrant; they are also remarkable in remaining half-closed, as it were. Colombia. (I. Hort., t. 120.) By some botanists this is regarded as a variety of *C. labiata Trianæi.*

C. citrina (*Lindl.*).—This fragrant and beautiful Orchid has the extraordinary habit of growing with its head downwards, and, indeed, is so obstinate in this respect that no coaxing of the cultivator has been able to induce it to grow upwards in the

usual manner. To succeed, therefore, with this plant, it should always hang with the growing-point downwards. It should be grown upon a block of wood, or in shallow pans, and fastened with some copper wire, with just a small portion of sphagnum and peat fibre; the atmosphere should be moist, and the temperature cool. It does well if placed in a warm, shaded corner of the Odontoglossum-house. The pseudo-bulbs are almost round, and they are inclosed in silvery coats or sheaths; each bears two grey leaves. The flowers are large, growing mostly singly, but sometimes in pairs, and wholly of soft lemon-yellow, the margin of the lip being wavy and white. It blooms during April and May, and owing to the great substance of the flowers, which are very fragrant, it lasts long in beauty. It is a native of Mexico, where its peculiar habit and great beauty early attracted the attention of naturalists. It has been in cultivation since 1838. (B. M., t. 3742.)

C. crispa (*Lindl.*).—The plant frequently catalogued under this name is *Lælia crispa*.

C. dolosa (*Rchb. f.*).—An exceedingly rare plant in cultivation. It may be called a large *C. Walkeriana* (indeed, by some it is regarded as a variety of that species), differing in the form of its pseudo-bulbs, the two leaves, and in the flowers springing from the leaf-growths, and not in a separate growth, a peculiarity known only in *C. Walkeriana*. The side lobes of the lip in *C. dolosa* are very broad, and overlapping; the colour of the whole flower is a soft lilac, suffused with white, the lip being broad and purple, with a white throat. Minas Geraes, 1872. It requires ordinary Cattleya treatment, with all the available light.

C. Dowiana (*Batem.*).—A magnificent Orchid and a free flowerer when well managed. It thrives in the Cattleya-house, suspended near the roof-glass. The scape bears from two to six flowers of great size; the sepals and petals are of a deep nankeen-yellow colour; the labellum is large and spreading, delicately frilled on the margin, and wholly of an intense, rich purple, shaded with violet-rose, and beautifully streaked with lines of gold. Its flowering season is during the late summer and early autumn months. It is a native of Costa Rica, whence it was introduced some years ago, but in bad condition. On its re-introduction in 1864, it was obtained by the Messrs. Veitch, and flowered in the autumn of the following year. This is also regarded as a variety of *C. labiata* by many present-day botanists. (B. M., t. 5618.)

Var. *aurea* (*T. Moore*).—This plant, commonly known as *C. aurea*, scarcely differs from *C. Dowiana*, except in the yellow

of the lip being more copious, and irregularly distributed. It is much freer-flowering than the type.

C. Eldorado (*Lindl.*).—This has stout, rounded pseudo-bulbs, which support a single large, deep green leaf. The flowers are nearly as large as in *C. labiata;* the sepals and petals vary in colour from pink to clear rose, and are more or less serrate at the edges; the lip is large and spreading, serrate at the edge, and purplish-crimson in front, whilst the throat is stained with deep orange and bordered with white. It blooms in July and August, and has been introduced from the region of the Rio Negro. Frequently classed as a variety of *C. labiata.* (Fl. des Ser., xviii., t. 1826.)

Var. *Wallisii.*—Flowers white, with a small blotch of orange on the lip.

C. elongata (*Rodr.*).—A fine species, similar in general characters to *C. guttata Leopoldi,* but with dull brown flowers, having a uniformly rosy-purple lip. It is a native of Brazil, whence it was introduced in 1882. Syn. *C. Alexandræ.* (B. M., t. 7543.)

C. Forbesii (*Lindl.*).—Stems slender, 1ft. high, bearing two oval leaves, and erect spikes, with from two to five flowers, each of which is 4in. across; sepals and petals similar, yellowish-green; lip with a small, rounded blade, yellow, rayed and spotted with reddish-purple. It flowers in autumn. Brazil, 1823. (B. M., t. 3265.)

C. Gaskelliana (*Sander*).—One of the most beautiful of the *C. labiata* group, and especially valuable on account of its flowering at an unusual time, viz., July and August. Its pseudo-bulbs, leaves, and habit, are like those of *C. Mossiæ.* The flowers are full, and as much as 7in. across; sepals and petals pale purple, suffused with white, sometimes wholly amethyst-purple; the upper or folding parts of the labellum are the same colour as the petals, the lower, spreading part pale mauve, with a large, saddle-shaped blotch of deep yellow, or sometimes lemon-yellow. There are also two white blotches and a mottled deep purple one on the front of the lip. Some of the forms are much inferior to others, but a good one is equal to the best of the Cattleyas. It requires the same treatment as *C. Mossiæ.* Venezuela, 1883. This is often looked upon as but a variety of *C. labiata.*

C. gigas (*Lind.* and *André*).—This is now classed as a variety of *C. Warscewiczii.*

C. granulosa (*Lindl.*).—A slender-growing species. Leaves oblong. Flowers 4in. across; sepals and petals olive-green or yellow, sometimes marked with rich brown spots; lip whitish,

or yellow, with numerous crimson, raised spots or granulations —hence the name. Later introductions have produced some wonderful varieties. It should be included in every collection. It thrives under ordinary Cattleya treatment. Introduced from Brazil in 1840. Flowering season, autumn. (B. M, t. 5048.)

Var. *asperata.*—This has been described as a fine variety. Sepals and petals brownish, spotted with dark purple; lip yellowish at base, light vivid purple, with a broad white border in front, rough on the surface.

Var. *Schofieldiana.*—Sepals and petals greenish-yellow, spotted with crimson, the petals very narrow at the base, very broad and obtuse at the apex; lip rich purple, with whitish side-lobes, the middle lobe covered with lamellæ and papillæ. Leaves broad, two to a pseudo-bulb. Syn. *C. Schofieldiana.*

C. guttata (*Lindl.*).—This species attains a height of from 1½ft. to 2½ft., and bears a pair of oblong, dark green leaves upon the apex of the pseudo-bulbs; the scape is erect, bearing from five to ten flowers, each 4in. across; the dotted sepals and petals are green, tinged with yellow and crimson; lip white and rosy-purple. It flowers during autumn. Brazil, 1827. (B. R., t. 1406.)

Var. *Leopoldi* resembles the type in general habit; the flowers are produced during the summer, and differ from those of *C. guttata* in the colour of the sepals and petals, this being deep chocolate, with dark red spots; the lip is of a rich red-purple, white on the inner side. The fragrant blossoms are more numerous than those of *C. guttata*, as many as twenty being sometimes produced on each spike. It is a native of the Island of St. Catharine, Brazil, and was named in honour of the late King of the Belgians.

Var. *Prinzii.*—This is better known in gardens as *C. amethystoglossa.* It has a stronger habit of growth than any of the other varieties of *C. guttata.* The scape is erect and many-flowered, and the sepals and petals are rosy-lilac, beautifully spotted and blotched with purple. The lip is wholly of a rich deep purple or amethyst hue. It blooms in the spring, and requires more heat and brighter conditions than the majority of the Cattleya family during the growing season. Syn. *C. amethystoglossa.* (B. M., t. 5683.)

Var. *Russelliana.*—This beautiful variety was brought from the Organ Mountains in 1838, and is altogether a taller and larger plant, with larger and darker flowers than the type. (B. M., t. 3693.)

Var. *Sanderiana.*—By Kew this is regarded as a form of *C. labiata Warscewiczii.*

Cattleya.

C. Harrisoniana (*Batem.*).—A most useful plant for cut-flower purposes. The pseudo-bulbs are about 1½ft. high, bearing a pair of leaves each. The flowers are 4in. across, spreading, the sepals and petals equal, the whole being soft rose-colour, save the base of the lip, which is stained with yellow. It usually blooms during July and August, lasting a month in

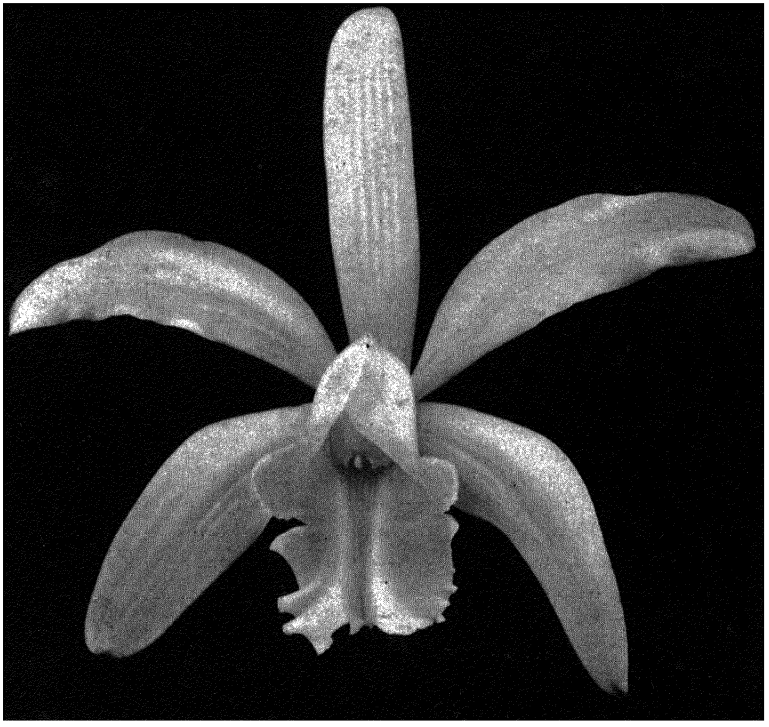


FIG. 27. FLOWER OF CATTLEYA INTERMEDIA ALBA (nat. size).

full beauty. Brazil, 1836. *C. Harrisoniæ* is given by Kew as the correct name of this plant, which is by them referred to as a variety of *C. Loddigesii*. (P. M. B., iv. 247.)

Var. *candida*.—Flowers white.

Var. *maculata*.—Sepals and petals dotted with purple.

Var. *violacea*.—Flowers purplish-rose.

Cattleya.

C. imperialis (*Hort.*).—A synonym of *C. Warscewiczii.*

C. intermedia (*R. Grah.*).—There are several varieties of this charming and easily-managed species. The stems are slender, jointed, 1ft. high, two-leaved; the leaves are ovate, 6in. long. The blossoms are borne on an erect scape, usually three to five



FIG. 28. FLOWER OF CATTLEYA LABIATA ALBESCENS (nat. size).

flowers on each, and they are 4in. across. The sepals and petals are soft rose, shaded with purple; the lip is paler in colour, blotched in front with deep violet-purple. It blooms during May, June, and July. It is an old inhabitant of our houses. Neighbourhood of Rio, 1824. Syn. *C. amethystina.* (B. M., t. 2851.)

Cattleya.

Var. *C. i. alba* (Fig. 27) is the whitest of any known Cattleya. It is held in high esteem, and sometimes flowers among imported plants. It is a rare and valuable variety.

C. labiata (*Lindl.*).—This name is used by the Messrs. Veitch for a large group of distinct kinds which are reduced by them to mere varieties. To us, however, it appears much the simpler plan to treat such as *C. Mossiæ*, *C. Trianæi*, *C. Dowiana*, &c., as species, therein following the late Professor Reichenbach. The typical plant, now known as *C. labiata vera*, is robust in habit, attaining a height of from 18in. to 20in.; it bears a single, broad, leathery, dark green leaf on a pseudo-bulb 5in. to 10in. long, swollen in the middle and furrowed. The flowers are large, measuring upwards of 6in. in diameter. The sepals and petals are very broad, and of a deep rose-colour, the latter being beautifully waved; the lip is large and somewhat folded, the front portion being of an intense deep velvety crimson, bordered with rose-lilac, and with a blotch of yellow below. The colours of this portion of the flower are gorgeous; and the substance and texture being singularly clear and translucent, the plant, when in full bloom, seems actually luminous. As we have already observed, this species was the first to flower in England, having been introduced from Brazil in 1818. It blooms always during the late autumn months, and lasts for a long time in perfection. Its habitat was practically lost for forty years, but since its reintroduction it has become a most commonly distributed plant, and may be met with in almost every garden. (B. M., t. 3998.)

Among the great numbers of plants imported of late years many charming forms have appeared, varying from intense shades of colour to delicate tints of white, the latter being very valuable and rare. The following are among the most prominent sub-varieties: *C. l. alba*, flowers pure white except the yellow throat; *C. l. albescens* (Fig. 28) has a faint tint of rose on the labellum, the remaining segments being white, excepting the yellow throat; *C. l. Cooksoniæ*, flowers white, except the front lobe of the lip, which is rich purple, and the yellow throat; *C. l. R. I. Measures* (Fig. 29), flowers pure white save for the lemon-yellow on the throat and most distinct rosy-pink veinings down the front lobe of the lip.

C. Lawrenceana (*Rchb. f.*).—A most useful species. The pseudo-bulbs are 6in. long, one-leaved, the leaf 9in. long. Flowers 5in. across, produced in spikes of from five to seven flowers or more; sepals narrow, pale purple or lilac; petals as broad again as the sepals, similar in colour; lip rolled



FIG. 29. FLOWERS OF CATTLEYA LABIATA R. I. MEASURES
(much reduced).

into a tube with a spreading front, which is purple, shaded with maroon and blotched with white. This species is almost tropical in its requirements. It should be treated as advised for *C. Dowiana.* Flowering season, spring. It was introduced from the Roraima Mountain, in British Guiana, by Messrs. Sander and Co., in 1884, and is named in compliment to Sir Trevor Lawrence. (B. M., t. 7133.)

C. Leopoldi (*Versch.*).—A variety of *C. guttata.*

C. lobata (*Lindl.*).—A synonym of *Lælia Boothiana.*

C. Loddigesii (*Lindl.*).—Similar in habit and stem to *C. Harrisoniana.* Flowers on erect peduncles, 4in. in diameter; sepals and petals equal, delicate rose-lilac; lip with a broad rounded blade, crisped at the margin, coloured pale amethyst-purple, with a pale yellow blotch on the disk. It blooms in August, and remains a long time in perfection. Although a small species, this is a desirable plant for amateur collections, being easily grown, cheap, and a free bloomer. It thrives under the treatment recommended for Cattleyas generally. Introduced by Messrs. Loddiges, of Hackney, early in the last century. It is one of the commonest of Orchids in Brazil.

C. Luddemanniana (*Rchb. f.*).—Another member of the *labiata* group, resembling *C. Mossiæ* somewhat in its flowers. The latter measure 8in. across, and are produced on spikes three or four together. The petals are three times as broad as the sepals, and the lip is large, folding well over at the sides. The whole flower is purplish-rose, except the spreading portion of the lip, which is of a deep amethyst-purple, with two blotches of yellow or creamy-white in the throat, where also there are diverging lines of bright amethyst. The plant is also called *C. speciosissima Lowii* and *C. Mossiæ autumnalis.* It is a magnificent Cattleya, but is somewhat difficult to flower. The flowers appear directly after the new growth attains full size, and not after a rest as the others do. It requires an airy, light position in the warm end of the Cattleya-house, and if carefully managed it should blossom in September and October. Introduced from Venezuela in 1854, and again in quantity, by Messrs. Low & Co., in 1883. (W. O. A. vi., t. 261.)

Var. *alba* has large, white flowers, the lip blotched with yellow.

Vars. *brilliantissima* and *Regina* are very deep-coloured forms.

Var. *Schrœderi* has white flowers, the lip blotched with yellow and lined with purple.

C. marginata (*Paxt.*).—A synonym of *Lælia pumila præstans.*

Cattleya.

C. maxima (*Lindl.*).—A useful species, producing several of its fine flowers upon one spike in November. The blossoms are 5in. across, rose-coloured throughout, of a pale hue when they first expand, gradually becoming darker; the lip, which is very large, is almost white, beautifully ornamented with dark purplish-crimson veins, and streaked in the centre with orange-colour.

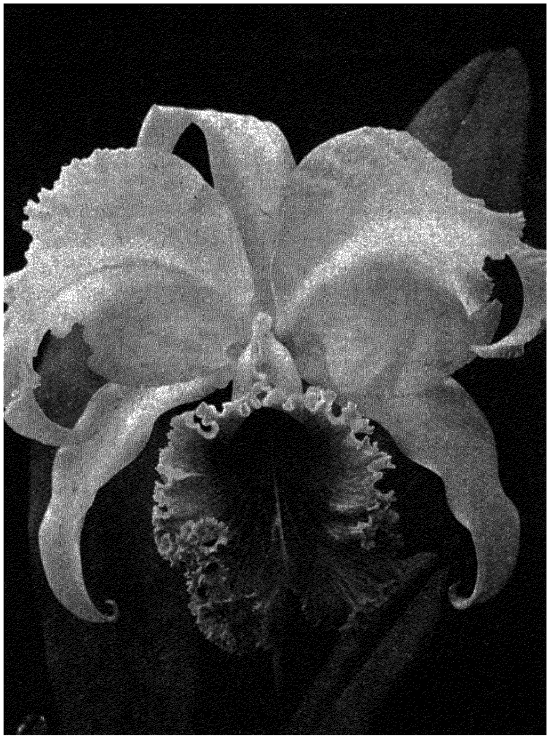


FIG. 30. FLOWER OF CATTLEYA MENDELLII
(much reduced).

The pseudo-bulbs are slender, about 1ft. long, one-leaved, the leaves from 6in. to 10in. long, and 2in. broad. Colombia and Guayaquil, 1844. (B. M., t. 4902.)

Var. *alba*.—Flowers white, with a yellow blotch and purple markings on the lip.

Var. *aphlebia*.—Lip without purple markings.

Cattleya.

A form with short stems and deep-coloured flowers is known as *Backhouse's* variety.

C. Mendellii (*Backh.*). — A magnificent Cattleya of the *C. labiata* section, and often referred to as but a variety of that species. The pseudo-bulbs are short, stout, and furrowed, and the leaf is oblong and leathery. The flowers are very large; the sepals and petals are white, or pale satiny pink, becoming, in most varieties, almost pure white soon after opening; the folding parts of the lip are the same colour as the petals, the spreading portion being very large, the margin crisped and wavy, and the colour rich crimson-purple, with a distinctly-defined blotch of yellow in the throat. This is one of the most popular of Cattleyas, and although varying a great deal, not one of its numerous varieties could be called poor. It is easily cultivated, thriving if treated as advised for the bulk of Cattleyas, and flowering annually from April to June. There are many named varieties of it, the best of which are described below. It was introduced in 1870, and large quantities of it are now imported annually from Colombia. (Fig. 30; W. O. A., i., t. 3.)

Var. *Bluntii.*—Flowers pure white, save for a small yellow blotch on the lip.

Var. *Leeana.*—Flowers deep-coloured, the petals blotched with amethyst-purple.

Var. *Morganæ.*—Flowers white, with a small purple blotch on the lip, which is veined with red.

C. Mossiæ (*Hook.*).—This grand old species should be represented in every collection of Orchids. The pseudo-bulbs are stout, variable in length, broadest in the middle, and furrowed; they bear a single, coriaceous, dark, shining green leaf. The scape bears from three to five flowers, measuring 6in. or 8in. in diameter; and even larger examples are on record. Although the flowers vary much, the sepals and petals are usually of some shade of blush or deep rose, the latter being sometimes as much as 3in. in breadth. The labellum is of the same colour, in most instances beautifully fringed or crimped round the edge; it is large and spreading, the front portion being suffused with rich violet, purple-veined, bordered with lilac, and, in addition, stained with orange at the base; the folding portion is veined with purple on the inside. By this marking of the lip this species is very easily distinguished from *C. labiata*, of which it is by some considered a variety. We have seen examples of this species with forty blooms expanded at one time, presenting a truly magnificent appearance. The flowers are produced from April to August, and will remain three or four weeks in full

beauty; they are deliciously fragrant. La Guayra, 1836. It was named in honour of Mrs. Moss, of Otterspool, near Liverpool, who once had a famous collection of Orchids. (B. M., t. 3669.)

Some of the most distinct and beautiful of the varieties are here given. Many others are in cultivation.

Var. *candida.*—Flowers white, the lip streaked with purple.



FIG. 31. FLOWER OF CATTLEYA MOSSIÆ VAR. REINECKIANA (much reduced).

Var. *Hardyana.*—Flowers lilac-purple, with magenta blotches on the sepals and petals; lip deep purple in the centre, with radiating veins.

Var. *Reineckiana* (Fig. 31).—Flowers white; disk and lip veined with deep purple.

Var. *Wageneriana.*—Flowers white, with a yellow blotch in the centre of the lip.

C. Mossiæ autumnalis (*Hort.*).—A synonym of *C. Luddemanniana.*

Cattleya.

C. Percivaliana (*Rchb. f.*).—A distinct and beautiful species of medium size, and not unlike a small *C. Mossiæ* in general characters. The colour of the flowers is, however, deeper, and the lip is exceptionally richly marked, being crimson shaded with maroon, rich yellow in the throat, and thickly veined with red and purple. The beauty of the markings on the lip cannot be easily described in words. The flowers are developed in mid-winter. There are several named forms of it, which differ from the type in the markings of the lip and the shade of purple in the sepals and petals. Venezuela, 1882. Sometimes referred to as a variety of *C. labiata.*

C. Pinellii (*Lindl.*).—A synonym of *Lælia pumila præstans.*

C. quadricolor (*Batem.*).—A synonym of *C. Trianæi.*

C. Regnelli (*Warn.*).—A synonym of *C. Schilleriana.*

C. Rex (*O'Brien*).—This is a very fine Cattleya of the *labiata* group, and probably referable to *C. aurea.* Sepals and petals varying from creamy white to yellow; lip crimson, veined with yellow, shaded white and yellow, and fringed with white.

C. Schilleriana (*Rchb. f.*).—This resembles *C. Aclandiæ* in its habit of growth, but the pseudo-bulbs are more robust, the texture of its leaves is more leathery, and they are reddish on the under side. The flowers are large, measuring between 3in. and 4in. in diameter, and are borne upon an erect scape, which is three- to five-flowered. The sepals and petals are olive-green, and more or less spotted with rosy-purple. The lip is large and spreading, the ground-colour being deep amethyst, tinged with rosy-purple; this is set off by a neat marginal border of white, whilst the throat is stained with yellow. It flowers both in early summer and in the middle of the autumn. It is a native of Brazil, whence it was introduced in 1857, and flowered in the collection of Consul Schiller, at Hamburg. It is sometimes known by the name of *C. Regnelli.* (B. M., t. 5150, var. *concolor.*)

C. Schofieldiana (*Rchb. f.*).—A synonym of *C. granulosa Schofieldiana.*

C. Schrœderæ (*Sander*).—This was for many years considered only as a variety of *C. Trianæi,* and the characteristics are very similar. The typical flowers are usually wholly rosy-lilac, excepting the orange-yellow through the basal centre of the lip, and hawthorn-scented. They are most attractive, and are produced immediately after *C. Trianæi* has finished in the spring. This species varies somewhat, and pure white varieties

have been found. Others have deeper shades of lilac and distinctive markings on the labellum. It is of good constitution, and does well with the usual Cattleya-house treatment. Colombia.

C. Skinneri (*Batem.*).—An old favourite with English Orchid-growers, and one that during the past few years has become very scarce. It enjoys a little more warmth than most of the species—the warm end of the Cattleya-house suiting it. The pseudo-bulbs are from 6in. to 12in. high, and bear a pair of deep green, oval leaves, 6in. long; the scape is erect, and bears from six to twelve flowers, each about 5in. across, and coloured a beautiful rose-purple except the lip, which is white, bordered with purple; the petals are as broad again as the sepals, the column is shorter than in most of the species, and the lip is folded into a tube at the base, spreading and open at the apex. The flowers are produced during April and May, lasting several weeks in full beauty. It was introduced in 1836 from Guatemala, where it was discovered by the indefatigable Mr. Skinner (whose name it bears). It is in great request among the natives of those regions for the purpose of decorating the altars of their churches, and is known to them as the Flower of S. Sebastian. It grows upon very high trees, and, according to its discoverer, is very difficult to get at. (B. M., t. 4270.)

Var. *alba* has pure white flowers, save for a primrose-yellow blotch on the lip.

Var. *oculata* is characterised by a large blotch of maroon on the lip.

Var. *parviflora* has smaller flowers than the type, and a uni-coloured lip. (B. M., t. 4916.)

C. speciosissima (*Hort.*).—A synonym of *C. Luddemanniana.*

C. superba (*Schomb.*).—A beautiful species. The pseudo-bulbs are slender, channelled, about 8in. long, purplish, two-leaved. Leaves 5in. long, ovate. Spikes three- to five-flowered; flowers 5in. across, bright rosy-purple, suffused with white, very fragrant; lip with acutely-angled side lobes folding over the column, the front lobe spreading, kidney-shaped, crimson-purple, with a blotch of yellow and white in front. This plant was very successfully cultivated by the late Mr. Spyers, who grew it as follows: The plants were fastened to a piece of soft fern-stem, and from the commencement of growth, till the flowers expanded, they were liberally watered, and suspended in the hottest stove. Whilst in flower they were placed in a cooler, airier house, which assisted the new pseudo-bulbs to ripen. After flowering, the plants were again removed to the hot-stove. When well managed

Cattleya.

this Cattleya is a most lovely Orchid. Flowering season, July and August. Tropical South America. (B. M., t. 4083.)

This species is not difficult to deal with when grown suspended in baskets, where there are slightly warmer conditions than are found in the Cattleya-house.

C. Trianæi (*Rchb. f.*).—This is an extremely variable species. In habit it resembles *C. Mossiæ*, but the pseudo-bulbs are usually thinner. The scape is many-flowered; the sepals and petals are rosy-lilac, varying to deep rose or white; the lip is of the same colour, stained at the base with yellow, and having the front lobe of a more or less rich purplish-violet colour. The blossoms last a long time in full beauty, if not damaged by water from the syringe. In some of the forms the flowers are as much as 8in. across. Colombia, 1860. Kew and other authorities regard this as a variety of *C. labiata*. Syn. *C. quadricolor*. (B. M., t. 5504.)

There are many named varieties, some of them being of exceptional beauty; one is:

Var. *alba*.—Flowers white, save for a blotch of purple on the lip.

C. velutina (*Rchb. f.*).—Flowers fragrant; sepals and petals orange, spotted with purple; lip orange and white, violet veined, reflexed at margin; stems slender, erect. Brazil. (W. O. A. i., t. 26.)

C. Walkeriana (*Gardn.*).—An elegant little plant, with short, conical pseudo-bulbs, bearing each one leaf; the spike of two flowers is developed on a separate flowering growth, which bears no leaves, and withers after the flowers fade. Flowers 5in. across, the sepals and petals overlapping and reflexed, rose-coloured; the lip has two broad side lobes, which also are rose-coloured, the rounded, spreading blade being brilliant amethyst outside, with radiating lines of a deeper colour, while the throat is yellowish-white. The flowers are developed in winter, and last in perfection about six weeks. This plant thrives best when grown in shallow teak baskets, or fastened to a piece of soft fern-stem. It likes plenty of light, shading only in very bright weather, and an abundance of moisture always. It is rather a shy flowerer. Brazil, 1839. Syn. *C. bulbosa*. (B. R., 1847, t. 42.)

Var. *nobilior*.—Flowers larger than in the type; side lobes of lip broader.

Var. *Schrœderiana*.—Stems not thicker than a goose-quill; flowers of a bright rose-purple; side lobes of lip small.

C. Warnerii (*T. Moore*).—One of the most beautiful of all Cattleyas, much resembling *C. labiata* in habit, and referred to that species as a variety. The scape is many-flowered, each bloom measuring upwards of 6in. across; the sepals and petals

Cattleya.

are broad, and of a deep rose colour; the large labellum has its middle lobe much expanded, deep rich crimson in colour, ornamented in front with an elegant marginal fringe, which adds considerably to its beauty. It blooms during the summer months, and continues long in perfection. The cultivation of this species is best accomplished by removing the plant to a



FIG. 32. FLOWERS OF CATTLEYA WARSCEWICZII (much reduced).

slightly warmer position than obtains in the Cattleya-house. As soon as the new growths make their appearance, in winter, water must be withheld. South Brazil, about 1859. (W. S. O., t. 8.)

C. Warscewiczii (*Rchb. f.*).—The flowers of this grand species are the largest of any found in the family; they measure 8in. or more across, and are a delicate mauve-purple; the lip is large, spreading, and rich crimson-purple, edged with a paler shade of purple; there is a large blotch of yellow in the throat.

Cattleya.

The habit of the plant is similar to that of *C. Trianæi.* It should be treated as advised for *C. Warneri.* It blooms in July and August, but sometimes in May. Colombia. By some this plant is regarded but as a variety of *C. labiata.* Syns. *C. gigas* and *C. imperialis.* (Fig. 32.)

There are a number of forms associated with this species, but it would not serve any good purpose to enumerate them here.

The following Hybrids have been raised and introduced up to the time of going to press:

Aclandi-Loddigesii.... *Loddigesii* and *Aclandiæ* (Veitch).
Adela *Trianæi* and *Percivaliana* (Veitch).
Adonis Syn. *Enid* (Maron).
Alberta Syn. *Breautiana.*
Alberti Syn. *porphyrophlebia.*
Apollo *Mossiæ* and *Aclandiæ* (Veitch).
Ariel..... *Bowringiana* and *Gaskelliana* (Veitch).
Armainvilliersis .. *Mendellii* and *Warscewiczii* (Rothschild).
Ashtonii *Harrisoniana* and *Warscewiczii* (Hollington).
Astrea *Skinneri* and *Loddigesii* (Maron).
Atalanta *guttata Leopoldi* and *Warscewiczii* (Veitch).
Bactia *Bowringiana* and *guttata* (Veitch).
Ballantineana *Trianæi* and *Warscewiczii* (Sander).
Balliana *Trianæi alba* and *Eldorado crocata* (Sander).
Baron Schræder *Trianæi* and *dolosa* (Sander).
Brabantiæ..... Syn. *Aclandi-Loddigesii.*
Breautiana *Loddigesii* and *superba* (Maron).
Browniæ *Harrisoniana* and *Bowringiana* (Sander).
Burberryana *intricata* and *superba* (Veitch).
calummata *intermedia* and *Aclandiæ* (Bleu).
Cecilia *Lawrenceana* and *Trianæi* (Ingram).
Chamberlainiana *guttata Leopoldi* and *Dowiana* (Veitch).
Chloe..... *Bowringiana* and *bicolor* (Veitch).
Chloris *Bowringiana* and *maxima* (Veitch).
citrino-intermedia Syn. *Lamberhurst Hybrid.*
Claridian *Luddemanniana* and *intermedia.*
Clarkiæ..... *bicolor* and *labiata* (Clark).
Claudian *Luddemanniana* and *Schilleriana* (Charlesworth).
Cleymena *Rex* and *Warscewiczii* (Lindon).
Clytie *Bowringiana* and *velutina* (Veitch).
Comfrey Syn. *Jupiter.*
Cybele *Gaskelliana* and *Luddemanniana* (Veitch).
Dominiana *maxima* and *intermedia* (Veitch).
dubiosa *Trianæi* and *Harrisoniana* (Maron).
Eclipse *maxima* and *Skinneri* (Ingram).
elata Syn. *Cecilia.*
elatior *intermedia* and *Skinneri* (Mantin).
Elizabethæ Syn. *Miss Harris* (Ashworth's var.).
Ella *bicolor* and *Warscewiczii* (Veitch).
Elvina *Trianæi* and *Schilleriana* (Veitch).
Empress Frederick *Mossiæ* and *Dowiana* (Veitch).
Enid..... *Mossiæ* and *Warscewiczii* (Veitch).
Eros *Mossiæ* and *Walkeriana* (Veitch).

Cattleya.

Euphrasia	Syn. *Macænas*.
Eurydice	*labiata vera* and *Aclandiæ* (Veitch).
Fabia	*labiata vera* and *Dowiana* (Veitch).
Fabiola	*Bowringiana* and *Harrisii* (Veitch).
Fascelis	*Aclandiæ* and *bicolor* (Veitch).
Fernand Denis	*Aclandiæ* and *Warscewiczii* (Maron).
Feuillatii	*Leopoldi* and *superba* (Maron).
fimbriata	Syn. *calummata*.
Firebrand	*Schilleriana* and *Lawrenceana* (Ingram).
flavescens	*Trianæi* and *lutcola* (Maron).
flæveata	Syn. *picta*.
Fowleri	*Leopoldi* and *Hardyana* (Sander).
fulvescens	*Forbesii* and *Dowiana aurea* (Charlesworth).
F. W. Wigan	*Schilleriana* and *Dowiana aurea* (Wigan).
Gaudii	Syn. *Patrocinii* (nat. hyb.).
Gauthieriana	*Schrœderæ* and *guttata Leopoldi*.
Gertrude	*superba* and *Mossiæ* (Veitch).
Goosensiana	*Schilleriana* and *Gaskelliana* (Peeters).
Grand Duchess Elizabeth	Syn. *Lawre-Mossiæ*.
Grayæ	*granulosa Schofieldiana* and *velutina* (Wigan).
Hardyana	*Warscewiczii* and *Dowiana aurea* (Cookson).
Harold	*Gaskelliana* and *Warscewiczii* (Cookson).
Harrisii	*guttata Leopoldi* and *Mendellii* (Dr. Harris).
Helen	Syn. *Breautiana*.
H. Hannington	*guttata Leopoldi* and *Maronii* (Measures).
Hislopii	Syn. *Preciosa*.
H. S. Leon	*Schrœderæ* and *Warscewiczii* (Leon).
hybrida	*guttata* and *Loddigesii* (Veitch).
intermedio-Percivaliana	*intermedia* and *Percivaliana* (Maron).
intermedio-superba	*intermedia* and *superba* (Bleu).
intertexta	*Mossiæ* and *Warneri* (Veitch).
Iris	*bicolor* and *Dowiana aurea* (Charlesworth).
John Bangley	Syn. *Mrs. J. W. Whiteley*.
Johnsoniana	Syn. *Ashtonii*.
Julia	Syn. *Portia*.
Juno	*Forbesii* and *velutina* (Roebling).
Jupiter	*Lawrenceana* and *Warscewiczii* (Ingram).
Kienastiana	*Luddemanniana* and *Dowiana* (Sander).
Kitty Lloyd	*velutina* and *Rex* (Sander).
La Belle	Syn. *Ashtonii*.
Lady Ingram	*Eldorado* and *Dowiana aurea* (Ingram).
La Fontaine	*Mendellii* and *guttata* (Maron).
Lamberhurst Hybrid	*citrina* and *intermedia* (Harris).
Landsbergii	*labiata* and *Dowiana aurea* (Linden).
La Nymph	*Gaskelliana* and *Eldorado* (Marriott).
Lawre-Mossiæ	*Lawrenceana* and *Mossiæ* (White).
Leander	*bicolor* and *Luddemanniana* (Charlesworth).
Lord Masham	Syn. *Breautiana* (Charlesworth).
Lord Rothschild	*Gaskelliana* and *Dowiana aurea* (Sander).
Lottie	*Aclandiæ* and *Trianæi* (Charlesworth).
Louis Chaton	Syn. *Cecilia*.
Louis Fournier	Syn. *Lady Ingram*.
Macænas	*Warscewiczii* and *superba* (Veitch).
maculata	*guttata* and *intermedia* (Veitch).
Maggie Raphael	*Dowiana aurea* and *Trianæi* (Leon).

Cattleya.

Manglesii	*Luddemanniana* and *Loddigesii* (Veitch).
Mantinii	*Bowringiana* and *Dowiana aurea* (Mantin).
Mariæ	*Mossiæ* and *Forbesii* (Mantin).
Mariannæ	Syn. *Baron Schræder.*
Maronii	*velutina* and *Dowiana aurea* (Maron).
Marriottiæ	*Eldorado* and *Warscewiczii* (Marriott).
Mars	*Lawrenceana* and *labiata vera* (Sander).
Marstersoniæ	*Loddigesii* and *labiata vera* (Veitch).
Mary Gratrix.....	*Harrisoniana* and *granulosa* (Gratrix).
Mary Measures	Syn. *Miss Williams.*
maximo-Gaskelliana	*maxima* and *Gaskelliana* (Miller).

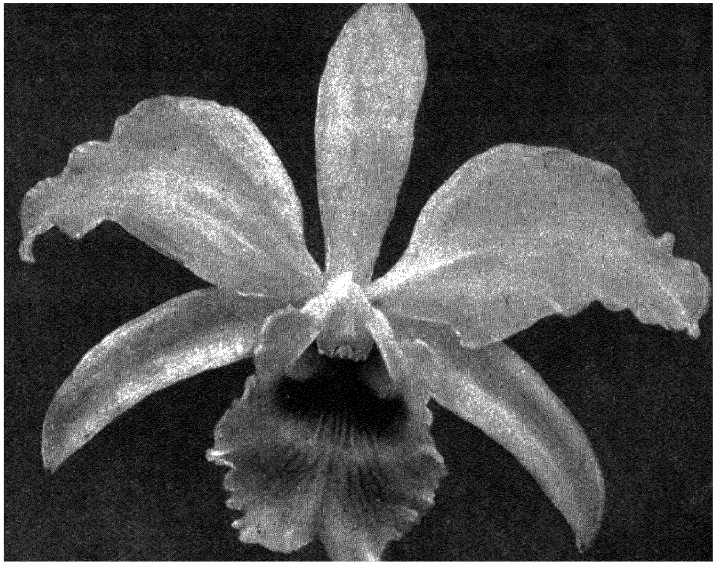


FIG. 33. FLOWER OF CATTLEYA MOLLIS
(much reduced).

Melpomene	*Mendellii* and *Forbesii* (Veitch).
Memoria Dillemagne	*granulosa* and *Mossiæ* (Dillemagne).
Minerva	*Bowringiana* and *Loddigesii* (Veitch).
Minucia	*Loddigesii* and *Warscewiczii* (Veitch).
Miranda	*Trianæi* and *guttata Prinzii* (Veitch).
Miss Endicott	*maxima* and *Loddigesii* (Chamberlain).
Miss Harris (Ashworth's var.).	*Mossiæ* and *Schilleriana.*
Miss Measures	*Luddemanniana* and *velutina* (Sander).
Miss Williams	*Harrisoniana* and *Gaskelliana* (Temple).
Mitchelli	*guttata Leopoldi* and *Trianæi* (Ainsworth).
mollis (Fig. 33)	*superba* and *Gaskelliana* (Wigan).

Cattleya.

Mrs. Herbert Greaves	Syn. *Miss Williams.*
Mrs. J. W. Whiteley	*Bowringiana* and *Hardyana* (Miller).
Mrs. M. Wells	*Parthinia* and *Warnerii* (Sander).
Niobe	*Mendellii* and *Aclandiæ* (Veitch).
Octave Doin	*Mendellii* and *Dowiana aurea* (Leeman).
Œnone	*Mossiæ* and *labiata* (Veitch).
Olivia	*Trianæi* and *intermedia* (Veitch).
Pandora	*bicolor* and *Trianæi* (Charlesworth).
Parthinia	*calummata* and *Mossiæ Wagnerii* (Bleu).
Peckaviensis	*Aclandiæ* and *Schilleriana.*
Pheiuona	Syn. *Dominiana.*
Philo	*Mossiæ* and *iricolor* (Veitch).
picta	*guttata* and *intermedia* (Veitch).
picturata	Syn. *picta.*
porphyrophlebia	*intermedia* and *superba* (Veitch).
Portia	*Bowringiana* and *labiata vera* (Veitch).
preciosa	*Luddemanniana* and *Lawrenceana* (Ingram).
Prince Albert	*Loddigesii* and *Trianæi* (Vincke).
Prince of Wales	Syn. *Parthinia* (Sander).
Princess	*Trianæi* and *Luddemanniana* (Veitch).
quinquecolor	*Forbesii* and *Aclandiæ* (Veitch).
Rajah	Syn. *Ballantineana.*
Rossii	*Leopoldi* and *intermedia* (Sander).
Rothwelliæ	*Eldorado* and *Bowringiana* (Rothwell).
Russeliana	*Warnerii* and *Schilleriana* (Mantin).
St. Benoit	*Schrœderæ* and *Aclandiæ* (Lawrence).
Sedenii	*Lawrenceana* and *Percivaliana* (Ingram).
suavior	*intermedia* and *Mendellii* (Veitch).
super-Forbesii	*Forbesii* and *superba* (Cypher).
Susannæ	Syn. *Lady Ingram.*
Templeæ	Syn. *Minucia.*
Thorntonii	*Luddemanniana* and *guttata Prinzii* (Thornton).
Thyeriana	*intermedia* and *Schrœderæ* (Orpet).
Triumph	Syn. *preciosa.*
velutino-bicolor	*velutina* and *bicolor* (Maron).
veriflora	*labiata vera* and *Trianæi* (Sander).
vestalis	*Dowiana aurea* and *maxima* (Veitch).
Viceroy	*labiata* and *Brymeriana* (Sander).
Victor Tongo	*Leopoldi* and *Dowiana aurea* (Maron).
Vulcan	Syn. *Miss Harris* (Ashworth's var.).
Warneo-Bowringiana	*Warnerii* and *Bowringiana* (R. I. Measures).
Warreniana	*Warscewiczii* and *granulosa* (Peeters).
weedonensis	*Mendellii* and *granulosa* (Thornton).
Wendlandiana	*Bowringiana* and *Warscewiczii* (Veitch).
William Murray	*Mendellii* and *Lawrenceana* (Cookson).
Zeno	Syn. *Mitchellii* (Charlesworth).
Zephyr	*Schrœderæ* and *Dowiana aurea* (Ingram).

The following are Natural Hybrids:

Batalinii	*intermedia* and *bicolor.*
Brymeriana	*Eldorado* and *superba.*
Cupido	*Schrœderæ* and *Mendellii.*
Czar	*labiata vera* and *granulosa.*
Dukeana	Syn. *Wilsonii.*
flaveola	*intermedia* and *guttata.*
Hardyana	*Warscewiczii* and *Dowiana aurea.*

Cattleya.

Imperator	Syn. *Czar.*
intermedio-Loddigesii	*intermedia* and *Loddigesii.*
intricata	*guttata Leopoldi* and *intermedia.*
Isabella	Syn. *Krameriana.*
Kerchoveana	Syn. *resplendens.*
Krameriana	*intermedia* and *Forbesii.*
Louryana	Syn. *Krameriana.*
Lucieniana	*Forbesii* and *guttata.*
Massaiana	Syn. *Hardyana.*
Mathoniæ.....	*Luddemanniana* and *Mossiæ.*
Measuresiana	*Aclandiæ* and *Walkeriana.*
Obrieniana	*Loddigesii* and *dolosa.*
Patrocinii	*Loddigesii* and *Leopoldi.*
resplendens	*granulosa* and *Schilleriana.*
scita	Syn. *intricata.*
sororia	*Walkeriana* and *guttata.*
undulata	*elongata* and *Schilleriana.*
venosa	*Harrisoniana* and *Forbesii.*
Victoria Regina	*guttata* and *labiata.*
Whiteii	*labiata* and *Schilleriana.*
Wilsonii	*bicolor* and *guttata.*

CEPHALANTHERA.

Very interesting and curious terrestrial British Orchids, of the tribe *Neottieæ*. Calyx of three ovate, acute, converging, permanent sepals; petals ovate, erect, as long as the calyx; lip scarcely spurred, saccate at the base, contracted in the middle, undivided, and recurvate at the end. The name *Cephalanthera* (*Rich.*) is derived from *kephale*, a head, and *anthera*, an anther; in allusion to the position of the latter. They thrive well in a chalky loam, and may be propagated by divisions or by seed.

CHONDRORHYNCHA.

Stove epiphytal Orchids from Colombia, belonging to the tribe *Vandeæ*, and requiring the same cultivation as the warm section of *Zygopetalum*. Sepals sub-equal, narrow, oblong; petals much broader; lip articulated at the foot of the column, sessile, broad, erect, concave, undivided; pollen-masses four. Lindley's name is from *chondros*, cartilage, and *rhynchos*, a beak; in allusion to the beak-like rostellum.

C. Chestertoni (*Rchb. f.*).—Flowers yellow; lateral sepals developing into a very long, sharp point; petals with a much-developed fringe; lip also with very long fringes. Colombia, 1879. A very curious species.

CHRYSOGLOSSUM.

Blume's name for a small genus of stove, terrestrial Orchids, of the tribe *Vandeæ*. They have the habit of *Tainia*, and are natives of India and Malaya. The generic name is from *chrysos*, yellow, and *glossum*, a tongue, and is in allusion to the colour of the lip. Flowers mediocre, shortly pedicellate, disposed in a lax raceme; pollen-masses two, free. Pseudo-bulbs narrow or wanting, one-leaved. The cultural requirements are similar to those recommended for *Calanthe*.

C. villosum (*Blume*).—Flowers yellow, banded with purple, villous, ¾in. in diameter, lateral sepals decurved; petals curved upwards; mid-lobe of lip panduriform; scape (with raceme) 1ft. to 2ft. long. Leaves solitary, 6in. to 12in. long, broadly elliptic or ovate, villous; petiole 1in. to 2in. long. Perak and Java.

CHYSIS.

Handsome stove epiphytal Orchids, belonging to the tribe *Epidendreæ*, Lindley's name for the genus being based on the fused appearance of the pollen-masses—from *chysis*, melting. The several cultivated species are remarkable for their large, fleshy flowers, and one of them—viz., *C. bractescens*—is handsome enough to rank among the most select of Orchids. All the species have large, fleshy pseudo-bulbs, about 1ft. long, thin at the base, and greyish-green. The leaves are lance-shaped, and have prominent nerves; when the growth ripens, the leaves wither and fall off. The flowers are in short racemes, and are developed along with the new growth; the sepals and petals are fleshy, broad and spreading, and the lip is large, with prominent side lobes and a recurved middle lobe. The introduced species are natives of Mexico or Colombia.

Culture.—Teak baskets, pans, or pots may be used for these plants; they like plenty of root room, good drainage, and a mixture of peat-fibre and sphagnum. When growing, they must have warm-house treatment, with plenty of water at the roots. When growth is finished, they should be removed to an intermediate-house, and be kept rather dry till they begin to grow again. They should be re-potted as soon as new growth is evident.

Chysis.

C. aurea (*Lindl.*).—A species having fusiform pseudo-bulbs, about 9in. long, and broad, lance-shaped leaves. The flowers are tawny yellow, somewhat cup-shaped, and the tips of the segments are marked with crimson on the inside. It remains in blossom about a month. Colombia, 1834. (B. M., t. 3617.)

C. bractescens (*Lindl.*).—A larger plant than *C. aurea*, the pseudo-bulbs being thicker, and the leaves broader. The flowers are developed about six together on a semi-drooping raceme, each one being nearly 3in. across; the sepals and petals are spreading, overlapping, and pure white; the lip is white, blotched inside with yellow, and marked with crimson lines and fleshy, teeth-like projections; the flowers appear in April and May, each lasting about a fortnight. Mexico, 1840. (B. M., t. 5186.)

C. Bruennowiana (*Rchb. f.*).—This is much in the way of habit of *C. aurea*; it bears several medium-sized pinkish flowers. It is a native of Peru, and was introduced more than forty years ago, and again as recently as 1893. Syn. *C. Oweniana.*

C. Limminghei (*Rchb. f.*).—This has pseudo-bulbs 1ft. long, broad, lance-shaped leaves, and arched racemes of large flowers, which are white, with purple-rose tips; the lip is yellow, striped with rose inside, the front being wholly purple-rose, with blotches and stripes of a deeper colour. It flowers freely in May and June. Central America. (B. M., t. 5265.)

C. Oweniana (*Hort.*).—A synonym of *C. Bruennowiana.*

The following are Hybrids:

chelsoni *bractescens* and *lævis* (Veitch).
langleyensis..... *bractescens* and *Sedenii* (Veitch).
Sedenii..... *Limminghei* and *bractescens* (Veitch).

CHYTROGLOSSA.

Two species of epiphytal Orchids, of the tribe *Vandeæ*, are included in this genus, founded by the younger Reichenbach. They have very short stems, and are natives of Brazil. The name is derived from *chytros*, a well, and *glossa*, a tongue, and has reference to the hollow at the base of the lip. *C. aurata*, having green and white sepals, white petals, and the base of column and lip purple-spotted, has been introduced, but is rare in cultivation. Flowers mediocre, shortly pedicellate; sepals and petals similar, free, spreading; lip continuous with the base of the column, obscurely

Chytroglossa.

three-lobed, with one or two callosities at the base; column short; racemes recurved or pendulous; leaves sub-distichously fascicled, oblong-elliptic or linear, flat. These plants should be grown in baskets in a moist position of the intermediate-house.

CIRRHÆA.

An interesting genus of stove Orchids belonging to the tribe *Vandeæ*, and founded by Lindley. The species, which are natives of Brazil and Mexico, are not remarkable for any particular beauty, and consequently they are rarely seen in cultivation. The rostellum being prolonged into a small tendril, or *cirrhus*, has given rise to the generic name. Flowers numerously produced on long, pendulous racemes, springing from the base of the pseudo-bulbs. When grown in pots, the spikes of these fragrant flowers hang down all round the sides, and present an effective appearance. They require the intermediate-house treatment. *C. saccata* (*Lindl.*) (B. M., t. 3726) and *C. viridi-purpurea* (B. M., t. 2978) are the two species that have been introduced.

CIRRHOPETALUM.

In this genus of Lindley's there are several beautiful little plants, remarkable for the structure of their flowers. They are of the tribe *Epidendreæ*, and closely allied to *Bulbophyllum*, from which they are distinguished by having their lateral sepals very much lengthened out. Indeed to this characteristic they owe their generic name — from *cirrhus*, a tendril, and *petalon*, a flower-leaf. About fifty species are known, nearly all of them being natives of tropical Asia. They are epiphytes, with roundish pseudo-bulbs springing from a creeping rhizome, and from each of which proceeds a single fleshy leaf. The scapes are erect and thin, and grow from the sides of the last-ripened pseudo-bulbs; the flowers are all arranged in a compact head, or umbel, on the top of the scape.

Culture.—These plants should be grown in baskets or pans, and suspended from the roof, where they may receive a goodly share of sun, air, and light. They enjoy



DENDROBIUM AINSWORTHII INTERTEXTUM.

Cirrhopetalum.

a liberal supply of water during the summer months, and, even during winter, nothing like drying-off should be attempted, although, as a matter of course, much less water will be required. If shaded from the sun's rays, the flowers may be enjoyed for a long time. They all require stove treatment when growing, and a lower temperature whilst at rest and when in flower.

C. Cumingii (*Lindl.*).—A somewhat slender-growing species, having small, four-angled pseudo-bulbs, oblong, blunt leaves, and large, regular, circular umbels of rich reddish-purple flowers in great profusion, elevated on thin, wiry stalks. The lateral sepals give a very peculiar appearance to the flower; they are 1in. long, linear-oblong, acuminate, projecting forward, and have a peculiar twist at the base, which brings the outsides of these two sepals on the same plane, their inner edges meeting together; the dorsal sepal and the petals are fringed with silky hairs, and the lip hangs so loosely that the slightest movement causes it to rock freely. Philippines, 1840. (B. M., t. 4996.)

C. graveolens.—This is now regarded as equalling *C. robustum* (*Rolfe*).

C. picturatum (*Lodd.*).—Though small in stature, this species is very free. The pseudo-bulbs are ovoid, and the leaves deep green. The scapes are thin and erect, bearing dense, circular umbels of emerald-green flowers, spotted with red on the shorter divisions; the two lateral sepals are prolonged and united so as to form a sleeve-like tube. It flowers in spring, and was introduced about 1840 from Malaya. (B. M., t. 6802.)

C. pulchrum (*N. E. Br.*).—A large-flowered species. Dorsal sepal roundish, abruptly running out into a hair-like point ½in. long, purplish, dotted with darker spots; lateral sepal connate into a convex oblong blade, 1¼in. long, yellow, mottled with purple; scapes 4in. to 5in. long, bearing about seven flowers in an umbel. Leaves stalked, oblong-obtuse, emarginate. Pseudo-bulbs short, distant, four-angled. Introduced from Tropical Asia, 1886.

C. robustum (*Rolfe*).—Flowers 2¼in. long; sepals and petals greenish-yellow, tinged with purple; lip deep reddish-purple; scape very stout, bearing an eleven-flowered umbel, 7½in. across. Leaves thick and leathery, 13in. long, 4in. broad. Pseudo-bulbs large, ovate, angled. New Guinea, 1893. Probably the largest species known. Syn. *C. graveolens.* (B. M., t. 7557; G. C., 1895, ii., p. 771, fig. 116.)

Cirrhopetalum.

C. Rothschildianum (*Hort.*).—Flowers bright crimson-purple, blotched with yellow on the sepals. The petals and column being covered at the apex with rich purple hairs, which move

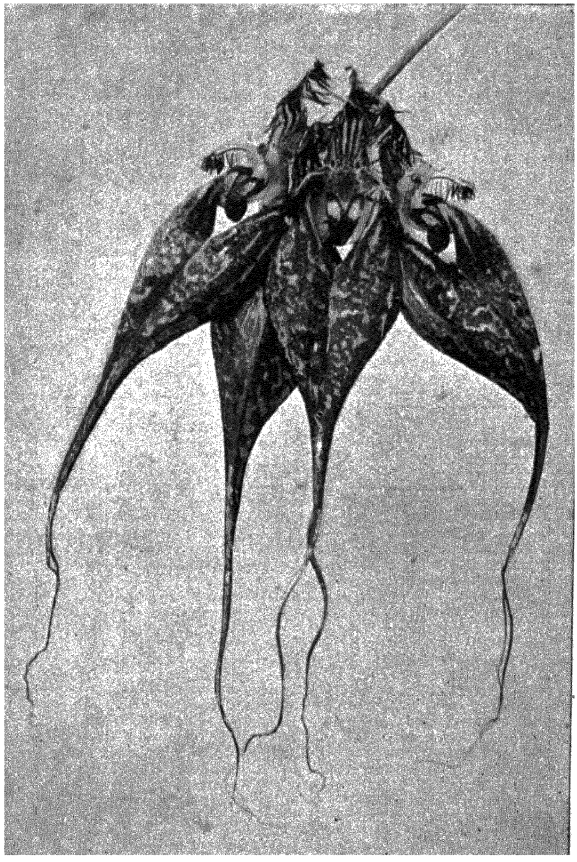


FIG. 34. FLOWERS OF CIRRHOPETALUM ROTHSCHILDIANUM (nat. size).

with the slightest wind, renders the flowers most attractive and quaint. Pseudo-bulbs ovate or pyriform. Darjeeling, 1895. Allied to *C. Collettii*. (Fig. 34.)

Cirrhopetalum.

C. Thouarsii (*Lindl.*).—A pretty-flowered species, of somewhat robust growth. The smooth pseudo-bulbs are produced from a creeping rhizome, or stem, and bear a single oblong, blunt, dark green, leathery leaf. The flowers are produced in umbels, on the apex of the slender scape; the long, strap-shaped sepals are of a tawny orange colour, whilst the remainder of the flowers are yellow, dotted with red. It blossoms during the summer months. Native of the Mascarene Isles, 1836. (B. M., t. 4237.)

CLEISOSTOMA.

Epiphytal Orchids, of the tribe *Vandeæ*. Flowers small, fleshy, with a pouched lip, and distinguished from those of *Saccolabium* in having the orifice of the pouch closed by a large projecting tooth. It is this characteristic that has given rise to Blume's generic name—from *kleio*, to close, and *stoma*, a mouth. Leaves leathery, narrow. Roots very long and tough. Though about forty species belong to this genus, yet only a few are in cultivation, and those are principally confined to botanic gardens. The cultural requirements are the same as for *Aërides*.

C. ringens (*Rchb. f.*). — This is a small species with oblong, emarginate leaves, 3in. to 4in. long, and 1½in. broad. The flowers are borne on a few-flowered raceme. They are yellowish, with the middle lobe purple, and an orange spot on the side lobes. The middle lobe of the lip is oblong, and faintly warted, and with a large tubercle under the column. The spur is very large, broad, cylindrical, emarginate at the apex. Philippines, 1888.

COCHLIODA.

About ten species of cool-house, evergreen, epiphytal Orchids, of the tribe *Vandeæ*, go to make up the genus *Cochlioda* (*Lindl.*). The name is derived from *kochlion*, a little shell, and is in reference to the curiously-shaped callus. They are natives of the Andes. Flowers often red, disposed in loose racemes, pedicellate; sepals equal, spreading, free, or the lateral ones more or less connate; petals nearly similar; claw of the lip erect, the lamina spreading, the lateral lobes round and often reflexed, the middle ones narrow, entire or emarginate, not exceeding the sepals; column erect, often slightly

Cochlioda.

incurved; scape one or more, springing from the base of the pseudo-bulbs. Leaves oblong or narrow, coriaceous, contracted into the petioles. Pseudo-bulbs one or two-leaved. The cultural requirements are similar to those recommended for *Odontoglossum*. The best species are:

C. Noezliana (*Rolfe*).—Flowers orange-scarlet, about 1in. across, with the disk of the lip yellow; lateral sepals longer and narrower than the dorsal one and petals; lip three-lobed, the middle lobe bluntly-obcordate; column triquetrous, dark; peduncles nodding or pendulous; racemes many-flowered. Leaves linear-oblong, acute, 4in. to 6in. long. Pseudo-bulbs 1½in. to 2in. long, one-leaved. South America, 1891. A most charming plant, allied to *C. vulcanica*. Syn. *Odontoglossum Noezliana* (*Hort.*). (B. M., t. 7474.)

C. vulcanica (*Benth.*). — Flowers 2in. across, bright rose; racemes erect, slender, twelve- to twenty-flowered. Peru, 1872. Syn. *Mesospinidium vulcanicum*. (B. M., t. 6001.)

Var. *grandiflora* is deep rose, and larger than the type.

CŒLIA.

Very curious, warm intermediate-house, epiphytal Orchids, belonging to the *Epidendreæ*. Lindley's name is from *koilos*, hollow, and has reference to the pollen-masses, which are convex outside, and concave inside. Sepals distinct, equal, spreading; petals nearly equal, but a little smaller than the sepals; lip quite entire, unguiculate, continuous with the base of the column, which is short. These plants do well under the same cultural conditions as *Lycaste*.

C. bella (*Rchb. f.*). — This is the species most frequently met with in cultivation. Flowers large, funnel-shaped, two to three on a scape, yellowish-white, with rose tips to the segments; lip yellow; fragrant; produced in autumn. Ile St. Catherine, 1882. The plant is sometimes described as *Bothriochilus bellus*. (B. M., t. 6628.)

CŒLIOPSIS.

A warm intermediate-house, epiphytal Orchid, of the tribe *Vandeæ*, and thriving under similar cultural conditions to *Epidendrum*. The name *Cœliopsis* (*Rchb. f.*) is from *Cœlia*, and *opsis*, like.

Cœliopsis.

C. hyacinthosma (*Rchb. f.*).—Flowers white; point of the superior sepal, and of the petals, orange, with a deep crimson blotch in the middle; peduncles arising from the base of the well-sheathed bulb, and carrying a dense raceme of six to eight flowers, which have a most delicious Hyacinth-like scent. Panama, 1871.

CŒLOGYNE.

Dr. Lindley established this genus in 1825, the first species described being the well-known *C. cristata*. It is of the tribe *Epidendreæ*, and the name is derived from *koilos*, hollow, and *gyne*, a pistil; in allusion to the female organ. The numerous species are confined to the tropical and sub-tropical parts of Asia. They are all epiphytes, with two-leaved, often very thick, angulate-ribbed, or sub-terete, pseudo-bulbs. As a rule, they have large, coloured, membranous flowers, with converging and slightly-spreading sepals, petals of like nature, but narrower, a great hood-like lip, usually bearing fringes on its veins, and a broad, membranous column. About sixty species have been described, many of which are in cultivation, and are deservedly held in high esteem. Those selected are most suitable for the amateur's collection, and with ordinary care will grow and flower freely. With few exceptions, these are what may be termed intermediate-house plants; for, although they like a somewhat higher temperature during the growing season, they remain healthier, and flower more abundantly, if kept in such a house during the resting and flowering time.

Culture.—Basket- or pot-culture is suitable for most of these plants. In preparing the pots for Cœlogynes, good drainage must be provided, as they require and enjoy an abundant supply of water during the growing season, though nothing stagnant or sour must be allowed to remain about the roots. For soil use about equal parts of living sphagnum and fibrous peat, with the addition of a little silver-sand. The plants should be raised upon a moderate-sized cone above the rim of the pot, and the soil firmly pressed about them. The time for re-potting or top-dressing Cœlogynes is just after the flowers are past; and as most of the kinds bloom during winter, re-potting is best done in the spring. Those species

Cœlogyne.

which have long, pendent racemes are most conveniently grown in teak baskets suspended from the roof; indeed, almost any of the Cœlogynes may be treated in this way, if they are kept thoroughly moist whilst growing.

It has been stated that these plants enjoy a copious supply of water during the growing season, but care must be taken that it does not lodge in the centre of the young shoots, or they will very likely damp off.



FIG 35. FLOWERS OF CŒLOGYNE CORRUGATA (nat. size).

When the growth is fully matured, just sufficient moisture to keep the pseudo-bulbs from shrivelling will be all that is necessary.

C. asperata (*Lindl.*).—A large-growing species, requiring the heat of a warm stove. It usually attains a height of about 2ft. The pseudo-bulbs are large and oblong, the stalked pair of broad leaves being dull green. The raceme is pendulous, about 1ft. in length, and many-flowered, each blossom measuring some 3in. in diameter. The sepals and petals are

cream-coloured, as also is the ground-colour of the lip, which is marked with chocolate and yellow streaks and veins, radiating from a rich orange-coloured central ridge or crest. The plant requires plenty of root room. It blossoms during the summer months, and is a native of Borneo, whence it was introduced in 1845. Syn. *C. Lowii.* (P. M. B., xvi., p. 225.)

C. barbata (*Griff.*).—A free-growing, robust species, with roundish, egg-shaped pseudo-bulbs, and leaves in pairs, each being about 1ft. long and 2in. broad. Flower-spikes erect, bearing a cluster of short-stalked flowers, each about 2½in. across; sepals and petals white; lip white, with a margin or fringe of dark brown hairs, and three ridges in the centre forming the crest. It requires cool-house treatment, and blossoms in January. North India, 1837. (W. O. A., t. 143.)

C. corrugata (*Lindl.*).—A pretty autumn-flowering species, with pseudo-bulbs much corrugated or wrinkled (whence the specific name), or apple-green in colour. The leaves, which are produced in pairs, are about 6in. long, and leathery in texture. The racemes are erect, and shorter than the leaves; the sepals and petals are pure white; the lip is white, with a yellow plate in front, and veined with orange. It is a native of Khasia and the Neilgherry Hills, and thrives under cultivation in an intermediate house. It was introduced in 1863. (Fig. 35; B. M., t. 5601.)

C. corymbosa (*Lindl.*).—This is closely related to *C. ocellata*, but larger in all its parts. The pseudo-bulbs are oblong, about 2in. long, bearing each a pair of broad lance-shaped leaves, 6in. to 1ft. long. Flowers 3in. across, in pendent racemes of about three flowers each; colour pure white, with two large orange-yellow spots on the front lobe of the lip, the throat being yellow and brown. Grown in a basket, or on a raft, this plant makes a handsome specimen, and when in flower it is a most beautiful Orchid. Himalaya, 1876. It requires the same treatment as *C. cristata.* (B. M., t. 6955.)

C. cristata (*Lindl.*).—One of the most beautiful of all East Indian Orchids, and one of the easiest to manage in a plant-house; it should, therefore, find a place in every collection. It is a healthy-looking plant when in growth during summer, and during winter it produces an abundance of flowers, which rival snow in their purity. They are graceful in form, large, fragrant, and last a long time when cut, or on the plant if not sprinkled. A plant with qualities like these is of exceptional value. When growing, the temperature of the Cattleya-house suits this species admirably; but during winter it should be kept

Cœlogyne.

cooler: when in flower, it may be removed to the drawing-room or the dining-room without fear of injury. It must, however, be placed in the greenhouse again as soon as the flowers wither, or the dryness of the atmosphere may cause the growths to be stunted, and thus one season's blossom would be lost The pseudo-bulbs are oblong or almost spheroid, smooth and shining, and apple-green in colour, bearing a pair of narrow, leathery, dark green leaves. The raceme is somewhat drooping, many-flowered, about 9in. in length; the blossoms are fragrant, and from 3in. to 5in. in diameter. The



FIG. 36. FLOWERS OF CŒLOGYNE CRISTATA ALBA (much reduced).

sepals and petals are snow-white, the former being broad and wavy, the latter narrower; the lip is also white, with a large blotch of rich yellow in the middle, the ridge, or crest, being ornamented with a golden fringe, to which the plant owes its specific name. Cultivated plants sometimes attain a remarkable size, as many as 500 or 600 pseudo-bulbs, bearing upwards of 100 spikes of snow-white flowers, with foliage of a beautiful fresh green, having been counted on one plant. Himalaya, 1837. (B. R., 1841, t. 57.)

Var. *alba* (Fig. 36) has every part of the flower of the purest white. Syn. *C. hololeuca.*

Cœlogyne.

Var. *Chatsworthi* has large pseudo-bulbs and fine flowers of unusual substance.

Var. *Lemoniana* flowers about a month later than the type, and has the blotch on the lip pale citron-yellow.

Var. *maxima* has larger flowers than the type.

C. Dayana (*Rchb. f.*).—A most beautiful plant when in flower. The pseudo-bulbs are long, pear-shaped, with stalked, ovate, pointed leaves, and pendulous spikes, 2ft. or more in length, bearing numerous flowers, which are pale ochre-yellow, with broad stripes of dark brown on the side lobes of the lip, and a crescent-shaped band of brown on the front. Each flower is nearly 2in. across; sepals and petals ligulate-acute; lip broad, three-lobed, and wavy; a spike often bears two dozen or more flowers. This species requires stove treatment, and should be planted in well-drained peat and sphagnum, in a basket. It blossoms in summer. Borneo, 1884. (W. O. A., t. 247.)

C. elata (*Lindl.*).—This species has tall, oblong, angled pseudo-bulbs. The flowers are medium-sized; sepals and petals white, narrowish; lip white, with a forked yellow band in the centre, and two orange-striped crests on the disk; racemes erect, springing with the leaves from the apex of the pseudo-bulbs. Leaves sword-shaped, striated. Northern India (8000ft. to 9000ft), 1837. (B. M., t. 5001.)

C. flaccida (*Lindl.*). — An erect-growing species, with oblong pseudo-bulbs, each bearing a pair of leathery, dark green leaves. The racemes are long, pendulous, and many-flowered; the sepals and petals are white, as is also the ground-colour of the lip, which is stained with pale yellow in front, and streaked with crimson towards its base. The flowers are produced during winter and spring, and continue in full beauty a long time. The scales at the base of the raceme are remarkable for their scorched appearance. This species should be grown in the intermediate-house. Nepal, 1829. (B. M., t. 3318.)

C. fuscescens (*Lindl.*).—A fine, bold-growing species, producing terete pseudo-bulbs 4in. to 5in. high. The leaves are broad and plaited, and about 9in. long. The raceme is few-flowered, and slightly pendulous; the flowers are large, having sepals and petals of a pale yellowish-red, tipped with white, a lip edged with white and streaked with orange-yellow, and two spots of cinnamon-brown at the base. It blossoms during the winter months, continuing in beauty for several weeks. It grows freely under ordinary Cattleya treatment. Moulmein, 1848. (B. M., t. 5494, var. *brunnea*.)

Cœlogyne.

C. Gardneriana (*Lindl.*).—A very distinct and attractive species, in which the pseudo-bulbs are smooth, long, and narrow, tapering from the base upwards, and resembling long flasks; each bears a pair of thin, lance-shaped, bright green leaves, from 1ft. to 1½ft. long and 3in. wide. The raceme is long and nodding, bearing many large, long-petaled flowers; these are pure white, except the base of the lip, which is stained with lemon colour. The bracts at the base of the flowers are large and white. The flowers do not open fully. It should be cultivated in an intermediate-house, and be kept free from thrips, which are very fond of its young leaves. It blossoms during the winter months. Native of Nepal and Khasia, at about 4000ft. elevation; introduced in 1837. (P. M. B., vi., 73; W. O. A., t. 153.)

C. graminifolia (*Par.* and *Rchb. f.*).—Sepals and petals lanceolate, acute, white; lip three-lobed, side lobes white, veined with brown, front lobe yellow, tipped with white; disk with three crisped keels, ending in brown lines. As the specific name suggests the foliage is grass-like, 1½ft. long, linear, leathery. Moulmein, 1888. (B. M., t. 7006.)

C. hololeuca (*Hort.*).—A synonym of *C. cristata alba.*

C. Lowii (*Paxt.*).—A synonym of *C. asperata.*

C. Massangeana (*Rchb. f.*).—Allied to *C. asperata*, this is one of the handsomest of Cœlogynes, and a first-rate grower when properly treated. The pseudo-bulbs are 3in. to 4in. long, pear-shaped, and two-leaved. The flower-spikes are pendent, and sometimes 2ft. long, bearing a score or more flowers, each being 2in. across; the sepals and petals are light ochre-yellow, and the lip is of a deep crimson-brown, marked with lines of yellow, the front lobe being white at the edge, and having a blotch of brown in the centre, through which run three yellow keels. This species should be cultivated in a Cattleya- or an intermediate-house, in a basket suspended from the roof, and be watered liberally when growing. Assam, 1879. (B. M., t. 6979; W. O. A., t. 29.)

C. ocellata (*Lindl.*).—A pretty little species, admirably adapted for basket-culture. The pseudo-bulbs are small and ovate. Leaves long, narrow, and bright green. Flower-spikes erect; the sepals and petals are pure white, as is also the lip, which is curiously fringed or crested, and streaked and spotted with yellow and brown at the base; on each of the side lobes there are two bright yellow eye-like spots, from which the plant takes its specific name. It usually flowers abundantly during the months of March and April, and should be grown in an intermediate-house. Sikkim, at 7000ft. elevation, whence it was introduced in 1838. (B. M., t. 3767.)

Cœlogyne.

C. odoratissima (*Lindl.*).—Of dwarf habit, with the pseudo-bulbs in dense tufts, about 1in. high, each bearing a pair of pale green leaves, 4in. in length. The raceme is slender and drooping, bearing sweet-scented flowers; these are pure white, except the centre of the lip, which is stained with yellow. It succeeds in a cool house, being found in large masses on the summits of the highest Neilgherry Hills, but always on the north side, and frequently growing among stones and wet moss. It flowers in April. Introduced in 1863. (Fig. 37; B. M., t. 5462.)



FIG. 37. CŒLOGYNE ODORATISSIMA
(⅓ nat. size).

C. pandurata (*Lindl.*).—A very striking species, remarkable for the singular colours of its flowers. The pseudo-bulbs are large, broadly ovate, compressed at the edges; they are several inches apart on the stout, creeping, woody rhizome. The leaves are 1ft. or 1½ft. long, plaited, broad, stout and leathery, and bright shining green in colour. The raceme is erect, longer than the leaves, and many-flowered, each flower being upwards of 3in. in diameter and very fragrant; the sepals and petals are bright green; the lip is of the same

colour, with the addition of several deep velvety black, raised ridges, or crests, running parallel upon its surface; in shape it is oblong, warty on the front, and curiously bent down at the sides, assuming somewhat the form of a violin, from which the plant takes its specific name. This species is a native of Malaya, where it grows on trees overhanging water in shady places, and blossoms during June and July. It requires tropical treatment all the year round, and thrives best when grown in a long basket, so that the rhizomes have room to develop. It first flowered in England in 1853. (B. M., t. 5084.)

C. Parishii (*Hook.*).—A small species, with four-angled, narrow pseudo-bulbs, 4in. long, each bearing a pair of broad, stout leaves, and a six-flowered raceme. The flowers are like those of *C. pandurata*, but smaller; they are produced in April and May, on plants grown in an intermediate-house and kept saturated in the growing season. A native of Moulmein; introduced in 1861. (B. M., t. 5323.)

C. Sanderiana (*Rchb. f.*).—Of comparatively recent introduction, and a most beautiful species. It is not unlike *C. cristata* in its flowers, but is quite different from that species in other respects, and especially in the treatment it requires. The pseudo-bulbs are ovate, 2in. long, wrinkled, and bear each a pair of leaves. These are 1ft. long, 2in. wide, ribbed, stalked, and dark green. The flowers are produced in loose racemes on the young growths, each raceme bearing about six snow-white flowers, which are 3in. across, the sepals being narrow, pointed, and keeled, the petals broader, and the lip three-lobed, the side lobes being striped with brown and the front lobe blotched with yellow. It requires tropical treatment, and plenty of water always. Introduced from the Sunda Isles in 1887 by Messrs. Sander and Co.

C. speciosa (*Lindl.*).—The pseudo-bulbs in this are large and oblong, each bearing a thin, dark green leaf about 9in. long. The flowers are produced singly or in pairs at the end of a slender peduncle, each flower measuring upwards of 3in. in diameter. The sepals and petals are brownish or olive-green, the latter being longer and narrower than the sepals. The lip is beautiful in both colour and marking, as well as in the exquisite fringe of the crests and margin; it is yellow, veined with dark red; at the base it is dark brown, and at the apex pure white. It is three-lobed, the lateral lobes being small and resembling ears. Two long crests run nearly the whole length of the lip, and are copiously fringed with hairs. A native of Malaya, 1845. It is a free-growing and free-flowering

plant, requiring the same treatment as *C. cristata.* (B. M., t. 4889.)

C. Swaniana (*Rolfe*).—An ally of *C. Dayana*, but having shorter pseudo-bulbs, leaves, and racemes. The flowers are white, with a brown lip and yellow veinings. Philippines, 1894. (R. ii., t. 92.)

C. tomentosa (*Lindl.*).—This species resembles *C. Massangeana.* It has pseudo-bulbs 2in. to 3in. long, and deep green; leaves 9in. to 12in. long, plaited, ovate-lanceolate; flower-stalks pendulous, tomentose, red-brown, bearing from fifteen to twenty flowers, which are 2½in. in diameter; sepals and petals orange-red; lip obovate, three-lobed, the side lobes erect, white, with red streaks, the mid-lobe square with three keels. It flowers in spring. Native of Malaya, 1870.

C. Veitchii (*Rolfe*).—This species is described in the "Kew Bulletin" as being "quite different from any previously known species, in its short columns, the absence of markings on the lip, and the very short, rather obscure, broad keels." The pure white flowers are 1in. across, produced in drooping racemes 2ft. long. Leaves lanceolate, 6in. long. Pseudo-bulbs fusiform, 4in. long. New Guinea, 1895.

COLAX.

Lindley established the above-named genus of the tribe *Vandeæ.* The name is derived from *kolax*, a parasite. By many it is now referred to *Lycaste.* The chief point of distinction lies in the shape of the flowers, which in *Colax* is sub-globose, and the segments are broad and spreading.

Culture.—C. jugosus should be treated as a pot-plant, the pots being thoroughly drained, and the compost formed of living sphagnum and good peat, to which may be added some medium-sized lumps of charcoal. When potted, it should be placed in the Cattleya-house and subjected to the same treatment as other Orchids from the warm parts of Brazil. It likes plenty of water during active growth.

C. jugosus (*Lindl.*).—This plant seldom exceeds 1ft. in height. The pseudo-bulbs are smooth, and somewhat ovate, about 2in. long, bearing a pair of dark green leaves, 6in. to 9in. long, upon their summit. The scape is erect, rising from the base of the pseudo-bulbs, and produces two or three flowers, which are 2in. in

diameter; the sepals and petals are creamy white without—the latter, however, are beautifully banded with transverse stripes of rich deep bluish-purple on the inside (Dr. Lindley describes them as speckled with crimson, but this is, at any rate, by no means usual); the lip is three-lobed, with fleshy ridges, white, and striped and veined with deep velvety-purple. This plant, when healthy, flowers freely during the months of April and May. (Fig. 38; B. M., t. 5661.)

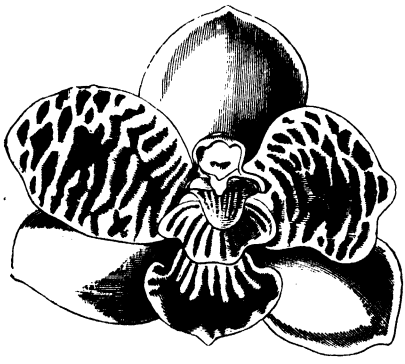


FIG. 38. FLOWER OF COLAX JUGOSUS (nat. size).

COLLABIUM.

Blume has given the above name to a small genus (two species) of stove, terrestrial Orchids, of the tribe *Epidendreæ*. They are natives of India, Java, and Borneo. Flowers in a long raceme on a tall scape; lateral sepals adnate to the trumpet-shaped foot of the long incurved column, to which the short lip is also jointed; pollinia two. The fact of the lip encircling the column has given rise to the generic name—from *collum*, a neck; and *labium*, a lip. They require hot-house conditions while in an active state of growth, and should be suspended in baskets near the glass. Ample drainage should be afforded, together with a compost consisting of equal portions sphagnum and fibrous peat. *C. simplex* (*Rchb. f.*) and *C. nebulosum* (*Blume*) are met with in botanic gardens, but otherwise they are rarely seen in cultivation.

COMPARETTIA.

Elegant, but somewhat rare, warm-intermediate, epiphytal Orchids, of the tribe *Vandeæ*, with handsome, generally drooping racemes of small but brightly-coloured flowers. *Comparettia* (*Pœpp.*) is a complimentary name to Andrea Comparetti, an Italian botanist. The species, which are found in Equatorial America, do best suspended in baskets in a compost consisting of two parts

Comparettia.

sphagnum and one part fibrous peat. A humid position at the warm end of the intermediate-house meets their requirements. They require a liberal supply of water during the growing season, and should never be allowed to remain in a dry condition for any length of time.

C. falcata (*Pœpp.* and *Endl.*).—Flowers in pendent racemes; sepals and petals deep crimson; lip the same colour, but thickly veined with a deeper shade. Peru, 1836.

C. macroplectron (*Rchb. f.*).—This is the commonest species in cultivation. Flowers are large, pale rosy-lilac, with the broad acute petals and square blade of the lip speckled with rose-red. Colombia, 1879. (B. M., t. 6679.)

CORYANTHES.

Hooker's name for a genus of South American Orchids of the tribe *Vandeæ*. The flowers are of such an extraordinary character that a correct idea of their structure and appearance can only be obtained by seeing them. The plants themselves are in habit similar to Stanhopeas, having lance-shaped, plaited leaves, upwards of 1ft. in length, and pendent racemes of flowers produced from the base of the pseudo-bulbs. The remarkable feature of the flower is the lip, which is helmet-shaped, and is attached to the rest of the flower by a thick, hooded stalk. Near the base of this stalk a sweet, watery fluid is secreted, which, during the time the flower is in full development, drips continuously into the helmet-shaped part. The name *Coryanthes* is from *korys*, a helmet, and *anthos*, a flower, in allusion to the form of the lip. The sepals and petals decay soon after opening, and the lip lasts only three or four days in perfection.

Culture.—Coryanthes require to be grown in baskets, in a compost of sphagnum and peat fibre, and as they need abundant supplies of water when growing, perfect drainage is essential. The plants grow naturally on the outer branches of trees, fully exposed to the sun, and therefore it is advisable, if possible, to place them along with the Dendrobiums and other heat- and light-loving Orchids. After the completion of the growth, the plants should have a drier position, and water should be

Coryanthes.

withheld as much as possible without allowing the pseudo-bulbs to shrivel.

C. Bungerothii (*N. E. Br.*).—This is a synonym of *Catasetum Bungerothii.*

C. macrantha (*Hook.*).—This remarkable plant flowers during the summer months, and bears a pendulous scape with two or three flowers, each measuring, when fully expanded, nearly 6in. in diameter. The sepals and petals are yellow, irregularly

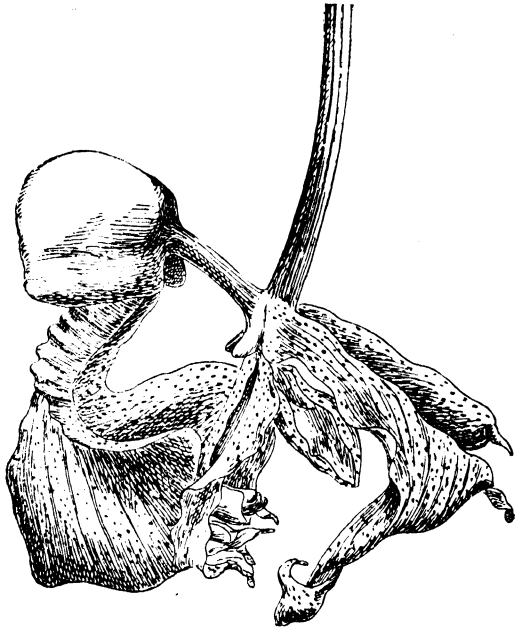


FIG. 39. FLOWER OF CORYANTHES MACRANTHA (½ nat. size).

spotted with purplish-red; they are very delicate in texture, and soon fade. The lip is fleshy and solid, with the pouch 2in. in diameter, and of a brownish-yellow colour, the projecting arm which supports it being dark purple. A powerful and agreeable odour is emitted by the flowers on first opening. This species —the finest of the genus—was introduced from Caracas about 1840. It is a most difficult plant to manage in cultivation, and has rarely flowered in England; yet it is one of the most wonderful of all Orchids. (Fig. 39; B. R., 1841, t. 22.)

Coryanthes.

C. maculata (*Hook.*).—A species with clustering, striated pseudo-bulbs, 5in. to 6in. in length, and tapering upwards. The leaves are two in number, broadly lance-shaped and somewhat membranous. The flowers are borne six to ten together on a pendent scape, and are of a pale brownish-yellow, the lip being tinged and spotted with purple. This species is found growing on the branches of trees in Tropical America, and was introduced into this country in 1829. (B. M., t. 3102.)

Var. *punctata* is an improvement on the type; the sepals and petals are thickly spotted with deep wine-purple, and the lip is also blotched with the same colour, the pouch being almost entirely purple.

C. speciosa (*Hook.*).—In the size and form of its pseudo-bulbs and foliage this resembles *C. maculata*. The scape is pendent, three-flowered, and each flower is about 3in. across, of a dull pinkish colour, spotted with dark brown, faintly, and not agreeably scented. This species is a native of Demerara, where it is common on large trees, forming large masses of closely-woven roots and pseudo-bulbs, which are usually the abode of families of irritating ants. Collectors find great difficulty in procuring these plants because of the pertinacity of the ants. All the Coryanthes have this character.

CORYCIUM.

About ten species of cool-house, terrestrial, South African Orchids, of the tribe *Ophrydeæ*, are included in the genus *Corycium (Sw.)*. Flowers small or mediocre, numerous, in a dense spike; dorsal sepal and petals connate, forming a helmet (hence the generic name—from *korys*, a helmet); lip erect or incurved, the claw adnate to the column. The cultural conditions are similar to those for *Disa*. It is questionable if any of the species are in cultivation.

CORYMBIS.

Tall, leafy, stove, terrestrial Orchids, of the tribe *Neottieæ*, broadly dispersed through the tropics of the East. Flowers mediocre or rather large, corymbose (a characteristic that is responsible for Thouars' name—from *korymbos*, a corymb), sub-sessile; sepals, petals, and lip linear; lip channelled,

Corymbis.

dilated at the apex; columns long and erect. There are six or seven species, but all are rare in cultivation outside botanic gardens.

COTTONIA.

According to the "Flora of British India," this is a monotypic genus of the tribe *Vandeæ*, Wight's name being a complimentary one to Major-General Cotton, C.S.I., an indefatigable collector. The species is an interesting stove Orchid, with a lip resembling that of *Ophrys aranifera*. It requires the East Indian-house treatment.

C. Championi (*Lindl.*).—This is now referred to *Diploprora Championi*.

C. macrostachya (*Wight*).—Flowers ¾in. across; sepals subspathulate; petals orange, with red streaks; lip dark purple, with a villous-golden margin; scape 1ft. to 1½ft. long, erect; branches few, tipped by short racemes. India, 1840 and 1885. Syns. *C. peduncularis* and *Vanda peduncularis*. (B. M., t. 7099.)

C. peduncularis (*Lindl.*).—A synonym of *C. macrostachya*.

CRYPTARRHENA.

Two species of intermediate-house, epiphytal Orchids, of the tribe *Vandeæ*, are included by Robert Brown under this name. The name is in allusion to the hidden anthers—from *kryptos*, concealed, and *arrhen*, a male. One species is found in the West Indies and West and Central America, and the other in Surinam. They are to be found in botanic collections only, and are of little horticultural interest.

CRYPTOCHILUS.

Wallich founded this genus, which contains a couple of species of stove, epiphytal Orchids, of the tribe *Epidendreæ*, natives of the Himalayas. They are rarely seen in cultivation. Flowers closely set in distichous spikes, shorter than their persistent bracts; sepals connate in an equally three-lobed, gibbous, five-toothed tube; petals narrow; lip included, adnate to the foot of the column, narrow, erect; pollinia eight. Pseudo-bulbs crowded, one- or two-leaved. The

Cryptochilus.

generic name is in allusion to the partially-hidden lip—from *kryptos*, hidden, and *cheilos*, a lip. The species should be grown in pots or shallow pans in a compost of equal portions of sphagnum and fibrous peat, with ample drainage.

CRYPTOPHORANTHUS.

Rolfe founded this curious genus of the tribe *Epidendreæ*. It has the habit of *Pleurothallis* (section *Aggregatæ*), but differs from that genus in the sepals being united into a short tube at the base, and again united at the apex, the only way into the flower being by the small window-like openings, one on either side. The structural peculiarity is responsible alike for the popular name of Window-bearing Orchid, and the generic one from *kryptos* (hidden), *phoreo* (to bear), and *anthos* (a flower). From *Masdevallia* the genus differs in habit, as also in the characters just given. The eight species known to cultivation are natives of the West Indies, the Andes, and Brazil. Similar culture to that recommended for the *Chimæra* section of Masdevallias will suffice. The chief species are here described, but all are of botanic rather than of general interest.

C. atropurpureus (*Rolfe*).—As the specific name suggests, the flowers are dark purple, solitary, and ½in. long in the bud; the petals are oblique and three-cusped; the lip is obtuse, sagittate, crested in the middle. Leaves oblong, narrowed at the base, almost equalling the stem; sheaths ventricose. Height 6in. A native of the West Indies, and introduced therefrom as long ago as 1838. Syn. *Pleurothallis atropurpurea.* (B. M., t. 4164, under name of *Masdevallia fenestrata.*)

C. Dayanus (*Rolfe*).—This is a more recent introduction than the preceding, having been here about twenty-two years. Upper sepal yellowish-white, with seven membranous keels, spotted with purple; inferior connate sepals orange, with some purple-brown spots and borders towards the apex. Leaves flat, dark green above, purple beneath, 4½in. by 3in. Colombia, 1880. Syn. *Masdevallia Dayana.* (G. C., 1886, xxvi., 428, fig. 86.)

C. gracilentus (*Rolfe*).—The blackish-purple flowers of this species are produced either solitary or in pairs. The leaves are oblong, acute, minutely three-toothed. Stems slender, 5in. to 7in. high, including the leaves. Costa Rica, 1875. Syn. *Masdevallia gracilenta.*

Cryptophoranthus.

C. maculatus (*Rolfe*).—This is a remarkable little plant from Brazil. The numerous flowers are yellow, densely spotted with crimson, $\frac{1}{6}$in. long. They are situate at the base of the leaf on a stem so short that the flowers lie upon the soil. The leaves are elliptic, obtuse, very fleshy, numerously blotched with purple on the upper surface, $1\frac{1}{4}$in. to $2\frac{1}{4}$in. long, $\frac{3}{4}$in. to $1\frac{1}{4}$in. broad. Syn. *Pleurothallis maculata.*

CYCNOCHES.

About a dozen species of this singular genus of the tribe *Vandeæ* have been introduced into this country at various times. It was founded by Lindley, and although only a few species are in cultivation, they are all of great interest, and some of considerable beauty. They resemble *Catasetum* in many respects, notably in the property some species have of producing two different kinds of flowers on the same plant. The thick and fleshy pseudo-bulbs are usually from 6in. to 10in. high, and bear several pointed, stoutly-ribbed leaves. The flowers are produced from the upper part of the pseudo-bulbs, and are generally large; their most prominent character lies in the long, slender column, which curves gracefully, and by fancifully resembling the neck of a swan suggested the generic name—from *kyknos*, a swan, and *auchen*, a neck. The plants are popularly known as Swan Orchids. All the species are natives of tropical America.

Culture.—These plants should be grown in fibrous peat and sphagnum, to which a little silver-sand may be added. They will succeed in either pots or baskets, provided these are well drained. During the growing season they require a light position in an intermediate-house, with copious waterings at the roots. It is advisable, however, to avoid wetting the foliage, as the centres of the growths are liable to rot if water is allowed to remain there. The leaves drop off in autumn, when the plants should be removed to drier quarters, and water almost entirely withheld until growth recommences.

C. aureum (*Lindl.* and *Paxt.*).—A handsome species, bearing numerous large, yellow flowers, closely arranged on a drooping raceme. The sepals and petals are lance-shaped, and dotted with purple, the latter being curved in at the tips. The lip is

small, and much divided, and the gracefully-curving column is marked with purple dots. Central America, 1851.

C. chlorochilon (*Klotzsch*).—One of the largest-flowered species, and a very striking plant. It has fleshy pseudo-bulbs 1ft. high, and ribbed leaves of the same length. The flowers,

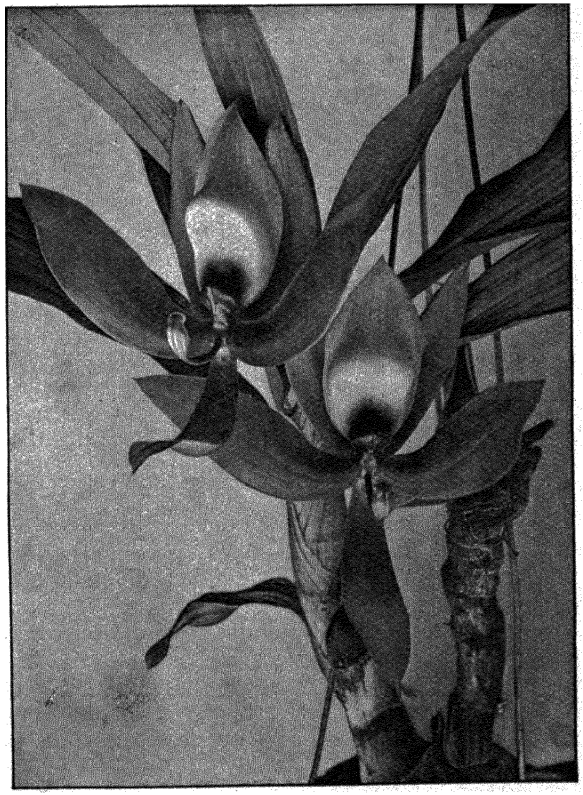


FIG. 40. FLOWERS OF CYCNOCHES CHLOROCHILON (much reduced).

which are borne on curving scapes from 8in. to 12in. long, are fragrant, and measure 5in. across. The sepals and petals are yellowish-green, and the lip (in the plants we have seen) is ivory-white, with a bronzy-green blotch in the centre; in some forms this blotch is bright yellow. The column is 2in. long,

and curved, whilst at the apex, where the pollen-masses are inserted, it is swollen into a roundish knob. This species is of easy culture, and flowers freely about June or July. Some varieties produce only three flowers on a scape, whilst in others we have seen as many as ten. A native of British Guiana, 1838. (Fig. 40; W. O. A., t. 263.)

C. ventricosum (*Batem.*).—This produces several—usually two—racemes of flowers from the axils of the upper leaves on the last-matured pseudo-bulbs; each raceme bears five flowers, and each flower has lanceolate sepals, the petals being curved downwards, and light green in colour. The lip is white, with a black callosity on the short claw that connects it with the column. The strange behaviour of this plant when it was first introduced caused no little surprise amongst botanists, and led to a careful investigation of the whole genus by Dr. Lindley. He wrote of *C. ventricosum*: "Such cases shake to the foundation all our ideas of the stability of genera and species, and prepare the mind for more startling discoveries than could have been otherwise anticipated." At one time it produces large green flowers, in a short spike, with broad, flat sepals and petals, and a white convex lip, and at another bears small blackish flowers in a very long drooping spike, the narrow sepals and petals folded back, the labellum disk-like, with a horn in the middle and projecting finger-like divisions round the edge. On one occasion these two distinct kinds of flowers were produced on the same spike. Guatemala, 1842. (B. M., t. 4054.)

C. Warscewiczii (*Rchb. f.*).—This plant also sometimes produces on one raceme flowers of quite a different appearance from those produced on another. It is supposed to be a sexual form of *C. ventricosum*, notwithstanding that both have been described, and are now cultivated, as distinct species. The larger, or female, flowers occur three or four together on a short raceme, and have broad sepals and petals, and a broad, pale green, undivided lip. The smaller, or male, flowers are produced on a long, pendent raceme of twelve to eighteen; they are wholly pale green except the lip, which is yellow, and much divided. In these flowers the column is long and curved, whilst in the larger form it is short and club-shaped. Guatemala, 1879.

CYMBIDIUM.

Thirty species are included in the genus *Cymbidium* (*Sw.*), of the tribe *Vandeæ*, but not more than half of them are known in cultivation. The genus is represented

Cymbidium.

chiefly in tropical Asia, a few species being found in Africa and Australia. Most of them have Flag-like foliage, the growths clustering, and the flower-spikes nearly always erect. Those here described have large fleshy flowers, the sepals and petals equal, the lip three-lobed, the two side lobes erect and half-inclosing the column, the front lobe tongue-shaped, with two elevated ridges. The generic name is derived from *kymbe*, a boat, and is in reference to the hollow recess in the lip.

Culture.—Cymbidiums are not difficult to grow when once established; but they are by no means easy to restore if imported in a bad state. They succeed best under pot-culture, and should be placed in good, rough peat, sphagnum, and a little sharp sand. Some growers mix turfy loam with the peat, and as a rule the plants thrive in this. They must never be dried, or the loss of many leaves will follow, to the great disfigurement of the plants; they require water at all seasons, but there must be a great difference made in the quantity supplied during the summer and the winter months. A warm, sunny corner in the Cattleya- or intermediate-house is the best position for them. When not growing they should be kept cooler, and at all times supplied with plenty of fresh air, avoiding cold chills. Many of the species have small and inconspicuous flowers, but the following are well worth growing.

C. cyperifolium (*Wall.*). — Flowers four to seven on a raceme, distinct, fragrant; sepals and petals pale green and yellow, streaked with red, acute; lip greenish or white, spotted with red, narrow; scape shorter than the leaves. Leaves rigid, 2ft. to 3ft. long, ½in. broad. Himalaya, 1895. This species resembles a miniature *C. Tracyanum* in flower, but is totally distinct therefrom.

C. Devonianum (*Paxt.*).—An interesting and pretty species. Sepals and petals light brown, with dull mauve-purple streaks and blotches; lip white, with numerous dark purple lines and blotches, the acute, reflexed, anterior part wholly of a fine, dark purple, almost rhomboid; racemes nodding, many-flowered. Leaves lanceolate-oblong, acute, with long channelled petioles. Northern India, 1837.

C. eburneum (*Lindl.*).—A deservedly popular species, in which the leaves are narrow and sword-shaped, arranged in a

distichous manner, bright light green in colour, and about 2ft. long. With age the plant forms a stout, stem-like pseudo-bulb, but when young it shows no sign of this. The raceme is erect, 8in. to 12in. long, and bears two or three beautiful, large fragrant flowers, which have ivory-white sepals and petals, and a white lip, stained with pale yellow, their odour resembling that of lilac. The blossoms are developed in spring, about March, and they last several weeks in perfection. A well-grown, well-flowered specimen is a beautiful object. Eastern Himalaya, 1846. (B. M., t. 5126.)

C. elegans (*Lindl.*).—This is now referred to *Cyperorchis elegans.*

C. giganteum (*Wall.*).—A strong and bold-growing species. The spike is stout, arching, and many-flowered; the blossoms are large, and have brown segments streaked with red, the lip being yellow, blotched with crimson. The plant has a distinct pseudo-bulb, which is clothed with the broad, sheathing bases of the long, sword-like leaves. It blossoms during the winter and early spring, lasting several weeks in full beauty. It requires intermediate-house treatment and plenty of water. It is a native of Northern India, where it was discovered by Dr. Wallich; introduced in 1837. (B. M., t. 4844.)

C. g. Lowianum.—A synonym of *C. Lowianum.*

C. grandiflorum (*Griff.*).—A large and handsome plant, the leaves being 2ft. long, green, striped at the base with yellow. The flower-spike is erect, arching above, and the flowers are 4in. to 5in. in diameter, bright olive-green, except the lip, which is straw-coloured, with a deep yellow margin, and blotches of dark crimson in front; there are also two crimson projections on the disk. It flowers in autumn, the blossoms lasting well if kept in a cool temperature. Sikkim-Himalaya, 1860. Syn. *C. Hookerianum.* (B. M., t. 5574.)

C. Hookerianum (*Rchb. f.*).—A synonym of *C. grandiflorum.*

C. Lowianum (*Rchb.*).—Without doubt the most popular species of the whole genus. The stout flower-spikes are from 2ft. to 4ft. long, arching, and clothed almost from base to point with flowers, each of which is 4in. across; the sepals and petals are equal, spreading, yellowish-green, with lines of brown, and the lip is scoop-shaped, with large, erect, yellow side lobes, the front being coloured deep maroon in the best varieties, brownish-red in others. The flowers are developed in March or April, and they remain fresh many weeks. This plant now occupies a first position among exhibition Orchids. It requires intermediate-house treatment, an abundant supply of water all

summer, a mixture of fibrous loam and lumpy peat, and a solution of cow-manure when the flower-spikes are forming. When in blossom, the plants should be removed to a greenhouse temperature. Burma, 1878. This was at first described as *C. giganteum* (*Wallich*) *Lowianum*. (F. M., ser. ii., t. 353.)

C. Mastersii (*Griff.*).—This is now referred to *Cyperorchis Mastersii*.

C. ochroleucum (*Lindl.*).—A synonym of *Camaridium ochroleucum*.

C. Parishii (*Rchb. f.*).—This is similar in habit to *C. eburneum*, but the leaves are broader. The spikes are erect, usually three-flowered, each flower of the same size as in *C. eburneum*; the sepals and petals are creamy-white; the lip is white, with a band of deep orange in the centre, and spotted with purple; the side lobes are also spotted with purple; the column is white, with yellow edges. A rare but exceedingly beautiful Orchid. Burma, 1874. (W. O. A., t. 25.)

C. pendulum atropurpureum (*Sw.*).—Though the type is very handsome, yet, as the majority of amateurs are limited for space, we can scarcely recommend them to grow it and the present variety also, which is far superior. The leaves are semi-erect, long, and narrow, very thick, leathery, and dark green. The spikes are pendulous, from 1ft. to 3ft. long, bearing many flowers of great substance. The sepals and petals are deep purple inside, and yellow outside; the lip is white, spotted and blotched with crimson. It blossoms during the spring months. Northern India, 1848. (B. M., t. 5710.)

C. tigrinum (*Parish*).—A dwarf plant, with compact pseudo bulbs, and erect, few-flowered spikes, altogether unlike the other species of this genus. The bulbs are as large as walnuts, furrowed and wrinkled, with two leaves on the apex and one on each side at the base. The leaves are strap-shaped, 4in. long, leathery, and grey-green. The scape springs from the base of the matured bulb, and is about 6in. high; it bears about three flowers, each of which is over 3in. across. The two lower segments hang downwards, and the other three are almost erect; they are green, tinged and spotted with brown. The lip is large, and three-lobed, the side lobes erect, and the front one spreading; it is white, with large blotches and spots of crimson. Tenasserim, 1864. (B. M., t. 5457.)

C. Tracyanum (*Hort.*).—Certainly one of the most desirable members of the genus. This flowered for the first time in Mr. H. A. Tracy's nursery, at Twickenham, in 1890, Mr. Tracy

Cymbidium.

having purchased it in an imported state some two or three years previously. No record could be traced in respect to its habitat, and Baron Schrœder, who purchased the plant, retained the only representative in cultivation for many years, and it was naturally considered rare, and highly prized. Recently plants have been imported with *C. Lowianum* for the latter species; in fact, many of the importations contained more of *C. Tracyanum* than of the species for which it was sold.

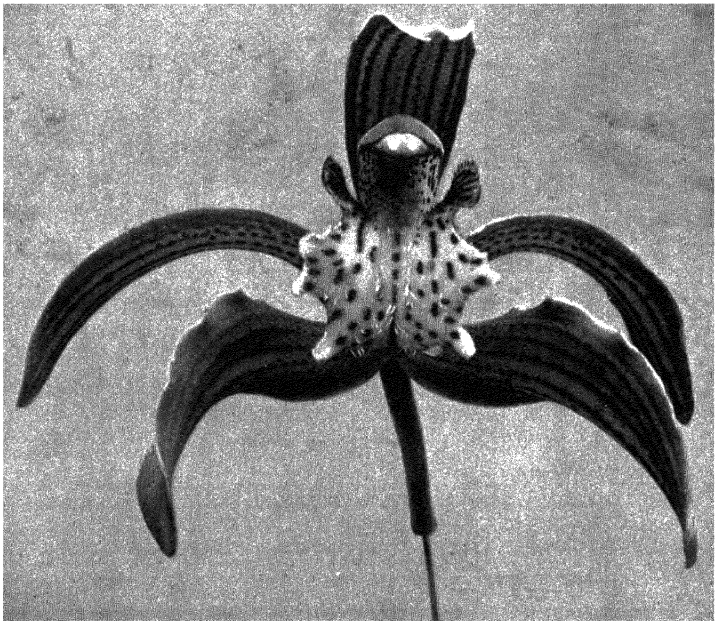


FIG. 41. FLOWER OF CYMBIDIUM TRACYANUM
(much reduced).

Consequently it has become freely distributed throughout Europe. It has been thought by some to be a large-flowered variety of *C. grandiflorum*, and by others to be a natural hybrid; but we consider it a totally distinct species. Flowers 5in. to 6in. across; sepals and petals greenish-yellow, with longitudinal lines of red-crimson dots and streaks, petals narrower than the sepals; lip three-lobed, the side lobes roundish-oblong, light

yellow, slightly streaked with red-crimson, the middle lobe broadly-oblong, reflexed, crisped, and fringed at margin, cream-white, spotted with red-crimson; column greenish, spotted red. (Fig. 41; G. C., 1890, p. 718.)

CYNORCHIS.

Some sixteen species of terrestrial Orchids, of the tribe *Ophrydeæ*, natives of the Mascarene Islands and Tropical Africa, are included in this genus. Formerly this genus was known by Thouars' name of *Cynosorchis*; but Lindley altered it to *Cynorchis*—from *kyon, kynos*, a dog, and *Orchis*. Flowers mediocre or rather small, shortly pedicellate; sepals sub-equal, concave, at length spreading; petals similar or smaller; lip continuous with the column, spreading, as large as the sepals, three- to five-cleft, produced in a spur; column very short, racemes very short or rarely elongated. The species require a warm, moist position in the intermediate-house. The compost should consist of equal portions of fibrous peat and sphagnum. These plants are rarely met with in cultivation. *C. grandiflora* (*Ridley*) and *C. Lowiana* (*Rchb. f.*) are grown at Kew.

CYNOSORCHIS (*Thou.*). *See* **Cynorchis.**

CYPERORCHIS.

Two or three species of epiphytal Orchids, of the tribe *Vandeæ*, constitute the above-named genus, founded by Blume. The name is from *Cyperus* and *Orchis*, in allusion to the resemblance to the former and the affinity with the latter. The species are natives of the East Indies and the Malayan Archipelago, and were formerly included and better known in gardens as Cymbidiums. *C. Mastersii* and *C. elegans*, the species cultivated, require similar treatment to that recommended for *Cymbidium*.

C. elegans (*Blume*).—The flowers of this are pale yellow or white, 1½in. long, inodorous, densely imbricated, remaining half-closed, cylindrical; they are produced upon many-flowered nodding racemes, the scape being 6in. to 18in. long, and densely clothed with sheaths 2in. to 5in. long. They are produced in autumn. The leaves are 1½ft. to 2ft. long. Introduced from Nepaul in 1840. Syn. *Cymbidium elegans*. (B. M., t. 7007.)

Cyperorchis.

C. Mastersii (*Benth.*).—In growth this somewhat resembles *Cymbidium eburneum*. The leaves, however, are longer, broader, and more recurved, and are destitute of that close-sheathing base so characteristic of the latter. The flowers, too, are smaller than those of *Cymbidium eburneum*, ivory-white, with a yellow throat; the lip is purple-spotted in front. This species is valuable, blossoming as it does in winter, the fragrant almond-scented flowers remaining a long time good. Introduced from Assam in 1841. Syn. *Cymbidium Mastersii*. (B. R., 1845, t. 50.)

CYPRIPEDIUM.

The genus *Cypripedium* was founded by Linnæus on our native species *Cypripedium Calceolus*, now unfortunately becoming exceedingly rare, if not altogether extinct in England, but still plentiful in some localities in Central Europe. The generic name is derived from *Kupris*, one of the Greek names of Venus, and *pous*, *podos*, a foot; in reference to the slipper-like form of the labellum. The popular names of Lady's Slipper and Slipper Worts are also obviously in allusion to the last-named characteristic. The genus belongs to the tribe *Cypripedieæ*.

We have decided to discard the recent divisions in respect of this genus that have been made by eminent botanists, and to class the Eastern section as *Cypripedium*, and the South American section as *Selenipedium*, the names that we are most accustomed to, and that have been in general use in gardens for many years. Although we have separated the genus *Selenipedium* from *Cypripedium* for purposes of reference, yet the cultural requirements being in most cases similar, it has been thought desirable to deal with both genera, so far as the latter is concerned, in the brief particulars that follow.

In the majority of Orchid genera, the botanical distinction is so small that the systematic botanist not infrequently experiences considerable difficulty in pointing out the characteristics by which they may be distinguished from each other; while even the tribes and sub-tribes are not always separated by an easily discernible and definite line. Not so, however, with the genus under consideration. A comparison of the flower of a Cypripedium with that of any other genus belonging to another tribe will show that

Cypripedium.

structurally it differs from it very considerably. Not only does the structure of the flowers of Cypripediums furnish evidence of their belonging to a more primitive type of Orchids than any other existing forms, but the geographical distribution of the genus also reveals some remarkable facts: all tend to show that the individual plants comprising them must at one time have existed in greater numbers, and have been spread over a much wider area than they at present occupy in a wild state. This leaves little doubt that the gradual process of extinction has been as surely in operation with this family as it has been in other families of the Natural Order that have become only subjects of study for the geological botanist. No doubt, however, the final extinction is far remote, and that the plants may be preserved indefinitely by the hand of man.

Paradoxical as this may appear to cultivators who have grown to regard Cypripediums as being amongst the easiest plants to propagate, the following considerations will go far to show that the statement here offered rests upon a good foundation. Although the Cypripediums are still spread over large portions of the surface of the earth, in both the Eastern and the Western Hemispheres, yet the species, almost without exception, have retreated to stations that are restricted in area, and are frequently isolated and remote from each other. Some species are still found to be abundant in their native habitats, and are frequently being imported in large quantities. It is very different with others. We will take for example *C. superbiens*, better known in gardens as *C. Veitchii*. Two plants of this beautiful species appeared accidentally among an importation of *C. barbatum*, and from these it is supposed that all the plants in cultivation have been derived. It is quite uncertain whether this species still exists in a wild state. Another illustration may be cited in the rare and highly-prized *C. Fairieanum*, whose habitat is unknown. All specimens that have existed in cultivation have been derived from a few plants that were first casually imported. The species has now become so scarce that at the present time there are not more than two or three plants in cultivation. Every endeavour has been made during the past twenty-five years to re-discover the

Cypripedium.

habitat of *C. Fairieanum*, but to no purpose. One of our principal importers has gone so far as to offer £1000 for the information that will lead to its re-discovery. We have no doubt that there are others who would be only too glad to supplement this amount for the same information. *C. Fairieanum* has helped to produce many interesting hybrids (see Fig. 42).

The Selenipediums of South America are also considerably localised. *S. Boissierianum* is one of the rarest and most beautiful among them. It was originally discovered by two Spanish botanists, Ruiz and Pavon, between the years 1778-89, who procured herbarium specimens. It was found again by William Lobb, travelling for Veitch during the period 1842-7. Its first introduction to British gardens was, however, made through Mr. Walter Davis, who found it (unknown to himself at the time) with *S. caudatum* in one of the valleys of the Andes of Peru, while collecting for Messrs. Veitch, in 1875-6. A single plant only of *S. Boissierianum* survived the voyage. It appears to have been easily propagated at first, but has now become practically extinct. Others are also remarkably localised, and the several species appear only on limited areas.

The hardy Cypripediums also abundantly demonstrate that amongst them, too, the process of extinction is in progress. Our native *C. Calceolus*, as before mentioned, has become virtually extinct in this country; but owing to its extensive distribution over Central Europe, it is still comparatively plentiful in places, while in others it is visibly yielding ground to the pressure of cultivation and the presence of a dense population. These remarks also apply to the Japanese, and to the majority of the North American species.

The true cause of the gradual extinction of the various species may probably be found in the reproductive organs of the flowers. A very close examination of these will quickly satisfy the most exacting observers that self-fertilisation is well-nigh impossible. The sexual apparatus is so constructed that it would be difficult to find an insect capable of effecting the necessary fertilisation by which the perpetuation of the plant by seeds is possible. In the future, therefore, it must be practically left to artificial fertilisation to provide striking developments and variations.



1 3 4 5

FIG. 42. A GROUP OF CYPRIPEDIUM FAIRIEANUM HYBRIDS
(much reduced)

1. *Niobe.* 2. *Regina.* 3. *Arthurianum.* 4. *Henry Ballantine.* 5. *Mrs. F. L. Ames.*

Cypripedium.

The variability of the species in some cases is very considerable. For example, take the well-known *C. insigne.* Recent importations have revealed many forms of sterling merit. The illustration (Fig. 43) shows *C. insigne*

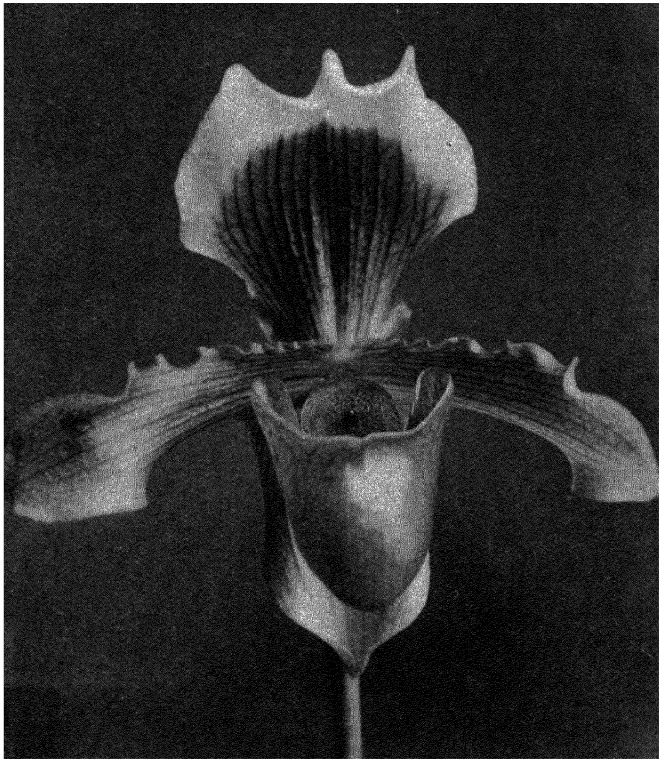


FIG. 43. FLOWER OF CYPRIPEDIUM INSIGNE SANDERÆ (nat. size).

Sanderæ, of which so much has been heard, and which was said to have realised £1000; but there is a great deal of difference between the amount it realised and its worth. No doubt many thousands of pounds have changed hands in the distribution of the plant. The two original

Cypripedium.

plants were sold for about seventy guineas each. The first division taken from them was sold for £100, and by repeated divisions the £1000 was realised. It is certainly one of the most beautiful Cypripediums in cultivation. Freaks of this description generally carry with them enormous value.

C. Lawrenceanum Hyeanum, *C. callosum Sanderæ* (Fig. 44), and *C. venustum Measuresianum* are all equally valuable from the expert point of view; but the typical forms are just as valuable, and we have no doubt would be preferred were they placed within the reach of the general cultivator in equal numbers. No other species is so rich in varieties as *C. insigne*. *C. Spicerianum*, judged from the point of view of beauty, has no superior; but it only varies in the size and substance of the flowers. *C. Charlesworthii*, *C. Curtisii*, *C. villosum*, and others cannot lay claim to extensive variations.

Hybridisation is now extensively practised with Cypripediums throughout the world, and many are the charming and desirable forms that have been placed in commerce. The named hybrids number over a thousand. It is, however, remarkable to note the number of these that are inferior in every way to the parents from which they have been evolved. Take *C. Spicerianum*, a species that has been used in considerably over 100 crosses; yet how few really good things have been produced therefrom. Strange to say, one of the best, and also one of the finest and most useful hybrids in cultivation—*C. Leeanum*—was the first derived from its use.

Out of the large number of crosses that have been made from *C. Spicerianum* there are only about half-a-dozen others that can be classed as really fine, although most of them possess good constitutions, flower freely, and are useful for cut-flower purposes. *C. villosum* also has been practically a failure as a parent. The experiences of the past should be greatly to our advantage in the future. By studying results we are able to select those parents that have proved most serviceable. In addition we have the large number of hybrids to afford new blood. So that with careful consideration we may look forward to great developments in the future.

Cypripedium.

Selenipediums have not the varied characteristics of Cypripediums; but it is remarkable to note the improvement that has been wrought where the pouchless *S. caudatum Lindeni* (Syn. *Uropedium Lindeni*) has been used. A grand race of hybrids and secondary hybrids has resulted from the intercrossing of *Selenipedium longifolium* and *S. Schlimii*. The whole of the *S. Sedeni* race take their origin from this cross. *There is, however, one thing that baffles all hybridists*, namely, to flower a hybrid derived from the intercrossing of *Cypripedium* and *Selenipedium*. There are several who assert that they have made crosses, and have succeeded in raising seedlings; but when such plants flower they generally prove to be stray Cypripedium seedlings. Or again it has been asserted that such crosses could not be induced to flower. We have crossed and intercrossed the two sections many times. True, we have never procured seed from a Cypripedium fertilised with a Selenipedium; but on the other hand have had what to all appearance has been good seed when the Selenipedium has been made the seed-bearing parent. So far we have never been able to induce such seed to germinate. We are also inclined to the belief that the

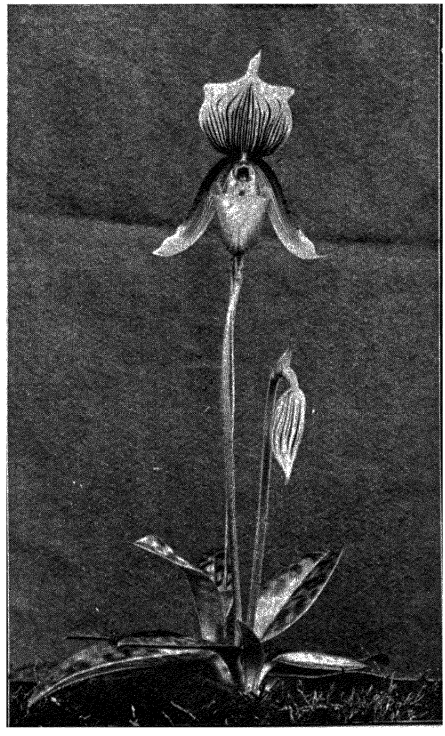


FIG. 44. CYPRIPEDIUM CALLOSUM SANDERÆ (much reduced).

Cypripedium.

genera are so widely divided that we may just as well entertain the hope of procuring seedlings by introducing the pollen of a Cattleya to that of a Cypripedium as to expect to effect crosses between the Cypripedium and the Selenipedium. We would say in this connection, just compare the pollen of the two sections. In Selenipedium it is of a powdery nature; in the Eastern section of Cypripedium it is without exception moist and composed of a wax-like substance. The two differ from each other to a far greater extent than is found to be the case with the other genera of the *Orchideæ*.

Up to the present time there are about forty species in the two sections. The Eastern section is practically confined to a comparatively limited space within the Indian Monsoon region. They sometimes follow mountain chains, on which the species occur in groups of twos or threes, or are isolated at great distances from each other. In other instances they are confined to islands or groups of islands. In the former case they usually occur at a considerable elevation, where the rainfall is copious and frequent, and the dry seasons are of short duration. Upon these elevated situations they are found growing chiefly on ledges, in crevices of the limestone rocks, and in other such positions where there is a small accumulation of decayed vegetable matter. Sometimes they are exposed to the sun's rays, but more frequently they are found under the shelter of the overhanging trees. The species confined to islands grow at a much lower elevation. These naturally require a higher temperature than that sufficing for the mountain species.

No genus of Orchids introduced to cultivation has yielded so readily to the means artificially provided for culture as the Cypripediums. Not only have the majority of species been retained in their normal condition of vigour, but the effects of cultural influence on many of them, especially those with tessellated leaves, are apparent in the increased size, substance, and more highly-coloured markings of the foliage. The flower-scapes also are more robust, the flowers larger, and the normally one-flowered scape occasionally becomes two-flowered. Doubtless the chief cause of these changes is the more abundant and more regular supply of nourishment by which the plants acquire

a vigour that is rarely found in those imported from their native countries.

For cultural purposes it is proposed to group the different sections under three headings: the Stove section (requiring a winter temperature of 60deg. to 65deg.); the Intermediate section (requiring a temperature of 55deg.); and the Cool section (requiring a temperature of 50deg.) The summer temperature ranges from 10deg. to 15deg. higher in each instance.

The *Stove section* comprises nearly the whole of the tessellated foliaged division, to which such species as *C. Lawrenceanum*, *C. barbatum*, *C. callosum*, and several others belong. To these must be added the green-foliaged section, to which *C. Stonei*, *C. Rothschildianum*, *C. Sanderianum*, *C. philippinense*, *C. Parishii*, *C. Lowii*, and others of the Bornean continent belong. The hybrids that have been derived from the intercrossing of these sections, and the whole of the Selenipediums, should also be included here. The potting compost that we find suits these sections best is a mixture of two parts peat to one of sphagnum, making the material moderately firm about the roots. The pots should be clean and sufficiently large to contain the plants comfortably. These plants in the majority of cases are thick-rooted, and require a reasonable amount of pot-room. Ample drainage of clean, broken potsherds must be afforded.

One of the chief items in the successful culture of Cypripediums is the water. Unless soft or rain-water can be afforded, considerable difficulty will be found in keeping the material in a desirable condition. With the frequent application of hard water the moss dies, and the decay thus begun quickly spreads to the remaining portion of the potting material, causing the whole to quickly become sour and inimical to the well-being of the plants. It is necessary, therefore, that every consideration should be given to the storage of rain-water. We need not dwell upon the general requirements of the stove Cypripediums here as regards watering, damping-down of the houses, &c. The methods that are practised in connection with the culture of stove plants generally will meet the requirements of this section of Orchids.

The *Intermediate section* includes such fine species as *C. Charlesworthii*, *C. bellatulum* and its allies, *C. niveum* and *C. concolor*, the natural hybrid *C. Godefroyæ*, *C. Druryi*, *C. Exul*, *C. hirsutissimum*, *C. Spicerianum*, the hybrids that have been derived from the intercrossing of these, as well as those produced by crossing them with certain members of the Warm- or of the Cool-house sections. The potting material here may differ according to localities. In the districts where the atmosphere is pure and free from the poisonous gases or the smoke and fog-laden atmosphere of large towns, a little fibrous loam may be added to the compost with advantage; but unless perfectly free from fogs, the compost should be as advised for the Warm-house section. The section that comprises *C. bellatulum*, *C. niveum*, and a few others are not the easiest to keep in good condition for many years. They usually grow freely for a few years, and then suddenly decline. We find that they do best when potted up in broken pieces of lime-rubble and tufa-stone, and placed close to the glass, maintaining the plants in a dry condition at the roots during the dull winter months of the year. The hybrids also that have been derived from the influence of the members of this section, as one of the parents, we find do best suspended from the roof-glass, where they obtain the maximum amount of light, and the air is in constant circulation about them.

The *Cool-house section* is perhaps more interesting than the whole of the previous sections put together, because it comprises the once despised, but now general favourite amongst market-growers—*C. insigne*, in its remarkable and varied forms, the lovely *C. villosum*, and *C. Boxallii*. These, combined with the numerous forms of *C. Sallieri* and *C. nitens*, are the most useful and easily accommodated of the whole genus. Their requirements are such as can be afforded by anyone in possession of a greenhouse in which the temperature previously given for this division can be maintained. The potting compost, as in the case of the Intermediate section, must be governed by the prevailing conditions in the particular locality. Where fibrous loam is used, a liberal sprinkling of sand, charcoal, or broken crocks should be added to keep the material in an open and porous condition.

Cypripedium.

Another most important item in the successful culture of Cypripediums is the shading. This requires constant attention, and although suggestions are made here, it does not follow that these suggestions may be altogether suitable. It must be borne in mind that a great deal must depend on the aspect of the house. A house with a southern aspect requires to be more densely shaded than one with an eastern or a western elevation. The particular circumstances of the atmospheric surroundings must also be taken into consideration. The best judges of the shading material required should be those in charge of the plants. An energetic and enthusiastic cultivator who studies the well-being of the plants in his charge should be in a position to give an opinion that should be more valuable than that of an expert. We have been using for several years past lath roller blinds on our Cypripedium-houses, and find them to be superior to the old canvas system. The blinds are let down on runners that are raised about 1ft. from the glass at the bottom; this allows the air to circulate. Moreover, the blinds being raised well above the glass, this does not get so warm as is the case where canvas is lying on the roofs. The interior of the houses is therefore maintained in a more desirable condition during hot weather. In winter, these blinds are most useful in cold and wind, diminishing the fire-heat requirements to a very considerable extent. In brighter districts, and in houses with southern aspects, a little additional shade may be required during the hottest part of the day in the summer. This may be afforded by the use of a few mats or a thin sprinkling of whitening or other shading material on the glass.

Increasing the stock may be done by division of the growths. If three or more growths are attached successively on the rhizome, the two front ones may be parted asunder from the base at the front of the third, and be carefully taken away with as much root as possible, leaving the old growth undisturbed in its position. This generally breaks satisfactorily, and a good plant is soon produced. The plant removed may be potted as desired. The best period at which to make divisions is at the time when the new roots are being emitted from the base of the

Cypripedium.

young or last made growths. Under such conditions, with the necessary encouragement, they soon become re-established.

To increase from seed takes a considerable time. In the first place between fertilisation and the ripening of seed twelve months must elapse, and a further period of three years must elapse before the plant may be expected to flower. This period would be altogether too long for the market-grower to wait for an increase of stock; but where rarities exist, such as *C. Lawrenceanum Hyeanum*, *C. callosum Sanderæ*, *C. insigne Sanderæ*, and others, it would pay to devote time and attention to their reproduction. In the few instances that we have experimented, we find that the species crossed with pollen of their own section produce far more fertile seed than those intercrossed with other species. The seed germinates satisfactorily when sown on the surface of the soil of Cypripediums, selecting for the purpose those plants in which the potting compost has become firm, and not newly-potted ones. Watering must be carefully done. It is to the careless use of the watering-can that the greatest number of failures in the rearing of hybrid Orchids may be attributed.

The tessellated foliage section, such as *C. Lawrenceanum*, *C. Curtisii*, *C. barbatum*, and others, do not find particular favour with market-growers, owing to the fact that they produce their flowers during the summer months, when flowers generally are plentiful. It is, therefore, to the autumn-flowering section that the grower has to give particular attention. *C. Charlesworthii* is the first to flower, followed by *C. Spicerianum*, *C. insigne*, and *C. villosum*, in the order named. Among the hybrids, perhaps *C. Harrisianum* is the most useful, owing to the fact that it produces two crops of flowers during the year. *C. Leeanum* is probably the best hybrid that has ever been introduced, and will prove of great assistance to the market-growers when it becomes more plentiful. The numerous other *C. Spicerianum* hybrids and the *C. nitens* section have all good constitutions and free-flowering characteristics, and will, as they become better known, prove useful.

The house most suitable for the Intermediate and Cool-growing sections is one having a low, flat roof,

Cypripedium.

where the plants may be brought within reasonable distance of the light. The staging should be covered with some material capable of retaining moisture—that will serve to counteract the influence of the fire-heat and assist in retaining the desired amount of humidity in the atmosphere. The ventilators should be placed in such a position at the bottom that the air admitted passes between the hot-water pipes before coming in contact with the plants; while the roof ventilators should be so arranged that direct draughts are avoided. The ventilation should be governed by the outside conditions, but preferably using the lower ventilators. The moisture in the atmosphere must also be governed by the outside conditions, always bearing in mind that with low temperatures the plants take little harm if they are allowed to become dry at the roots, and if the atmospheric moisture is reduced accordingly.

The following is a selection of the more noteworthy species and varieties of Cypripedium in cultivation at the present time :—

C. Argus (*Rchb. f.*).—Leaves 6in to 8in. long, 1in. broad, variegated with dark green on a yellowish-green ground. Flower-scape central, 1ft. high, single-flowered; dorsal sepal large, white, striped with green and purple; petals 3in. long, deflexed, wavy, white, with green stripes and rosy tips, the surface covered with purple eye-like spots; pouch broad, brown-purple. This requires Intermediate-house treatment. It flowers in March or April. Philippine Islands, 1873. (B. M., t. 6175.)

There are several named varieties, the best of them being *Moensii*, which has larger flowers, with petals more thickly and larger spotted, than the type

C. barbatum (*Lindl.*).—An old favourite, which is still very popular, on account of both its variegated foliage and the large, dark-coloured flowers. The leaves are strap-shaped, about 6in. long, leathery, channelled, light green, prettily blotched and spotted with dark green. The flowers are borne singly on erect scapes about 1ft. high. The dorsal sepal is large and broad, the lower portion being green, beautifully striped with purple, the upper half pure white; the petals are similar in colour, and ornamented with several tufts of black hairs, which are produced from the purple shining warts bordering the upper edge; the pouch is large, helmet-shaped, and blackish-purple in colour.

Cypripedium.

The plant blossoms during spring and summer, and lasts many weeks in full beauty. Malay Peninsula, 1840. (B. M., t. 4234.)

There are about twenty named varieties of this species. Many of these closely resemble each other. The most distinct are:

Var. *biflorum.* — Leaves narrower, and flowers smaller, than in the type; scape about 10in. high, usually two-flowered. Syn. var. *Warnerianum.*

Var. *nigrum.*—Flowers very large, and much darker than in the type. This is sometimes called *giganteum.*

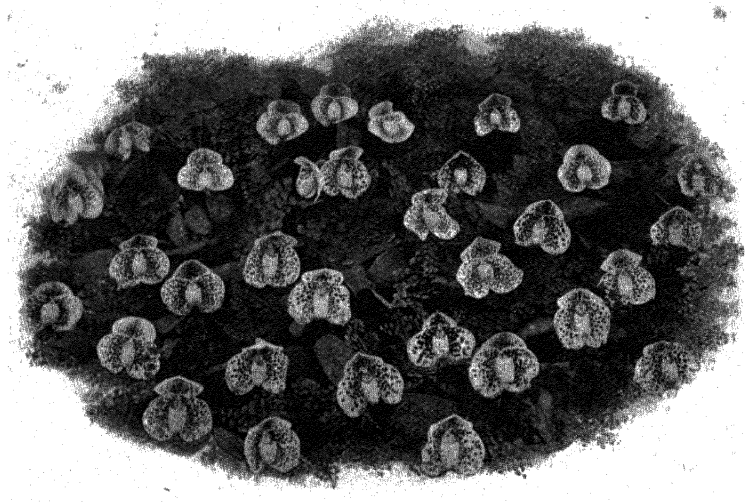


FIG. 45. FLOWERS OF CYPRIPEDIUM BELLATULUM (much reduced).

Var. *superbum.*—Leaves more clearly variegated. Flowers distinct in colour, the purple being deeper, and the white purer, than in the type.

C. bellatulum (*Rchb. f.*).—A very pretty species belonging to the same group as *C. concolor*, &c., but larger than any of them. The largest leaves are leathery, 10in. long, and 3in. in width, green, with grey marbling above, dotted with purple beneath. Scape 3in. to 4in. high, bearing one large flower 3in. in diameter, white, spotted all over with purple-black, some of the spots being large; the dorsal sepal is almost round, concave,

hairy on the outside; petals large, almost as broad as long, the lower edges meeting behind the labellum; pouch small, as in *C. concolor*. Hitherto this species has flowered at various seasons. The flowers are very varied in their marking. Burma, 1888. (Fig. 45.)

There are several named varieties of *C. bellatulum*, the most prominent amongst these being *C. b. album*, in which the flowers are wholly ivory-white, and fine in form and substance. It is one of the most beautiful of the white-flowered Orchids.

C. Boxallii (*Rchb. f.*).—This handsome, free-flowering species is related to *C. villosum*, which it resembles in foliage and in the form of its flowers. Leaves green, strap-shaped, 1ft. or more long. Scapes erect, one- or two-flowered; flowers large; dorsal sepal reflexed at the sides, greenish, with a white margin and numerous large purple spots; petals and pouch greenish-yellow, tinged with purple. The whole surface of the flower has a shining, varnished appearance. This species may be grown in a cool, intermediate temperature. It blossoms in January and February. Burma, 1877. (I. H., ser. iii., t. 345.)

There are several named varieties of this, but the following is the only one deserving special mention:

Var. *atratum*.—Flowers very large; dorsal sepal green, with a white margin and large blotches of black-brown; petals and pouch reddish-purple and pale green. (G. C., i., 1887, fig. 47.)

C. callosum (*Rchb. f.*).—In some respects this most desirable species resembles *C. barbatum* and *C. Lawrenceanum*. Leaves 6in. to 9in. long, bright green, with darker green tessellations; scape 12in. to 15in. long, one- (sometimes two-) flowered. Flowers, upper sepal 2½in. to 3in. broad, folded at the mid-vein, and undulate in the apical half, white, with alternate longer and shorter veins that are green at the base, becoming deep purple upwards; lower sepal smaller, white, with pale green veins; petals slightly deflexed, pale green, tinted with pale rose-purple towards the apex; margins ciliated, with some blackish warts on the upper one; lip brown-purple, shading to green beneath. Cochin China, 1886.

Var. *Sanderæ*.—This is the albino of the species. The flowers are wholly greenish-yellow and white. A choice and desirable addition, which is now becoming fairly distributed in collections. No collection of Cypripediums is complete without it. (Fig. 44.)

C. Chamberlainianum (*O'Brien*).—Flowers rosy-purple and white, in form somewhat resembling those of *C. spectabile*; sepals strongly pubescent at back; bracts large, boat-shaped; scapes 2ft.

high. Leaves strap-shaped. New Guinea, 1892. (G. C. 1892, xi., p. 241, fig. 34.)

C. Charlesworthii (*Rolfe*).—In habit of growth this resembles *C. Spicerianum.* The dorsal sepal is green at the basal half, suffused with rose-purple, and margined with white. The petals and lip are highly-polished brown. The disk of the column is white. This plant was first sent home to this country by the late David Burk, while collecting for Messrs. Veitch and Sons, in the Shan States, but the later-introduced plants were induced to flower first in Messrs. Charlesworth and Co.'s Nursery, at Bradford, in 1893. It is a most desirable and variable species, producing its flowers in the autumn. It does best in a cool, intermediate temperature.

C. ciliolare (*Rchb. f.*).—This belongs to the *C. superbiens* section. Leaves tessellated with deep and pale green. Flowers 4in. across. Upper sepal purple at the base, the remaining portion white; the veins are green, the larger ones sometimes purple towards the lateral margins. Lower sepal much smaller. The petals are margined with blackish-purple hairs; the basal portion is green, densely spotted with blackish-purple warts to two-thirds of the length. The apical portion is pale purple. Lip purplish-brown, shading sometimes to green at the base. It is a most distinct and desirable species. Introduced from the Philippine Islands in 1882, by Messrs. H. Low and Co.

C. concolor (*Batem.*).—A charming little plant, very similar to *C. niveum.* It has strap-shaped, fleshy, blunt-pointed leaves, about 4in. long, dark green, mottled with grey on the upper surface, vinous-purple on the under side. The scape is erect, short, one-, sometimes two-flowered; flowers 2in. across; the sepals and petals oval, almost similar in shape, concave; pouch small; the whole flower is coloured clear cream-yellow, with numerous small spots of cinnamon-red. The blossoms appear in autumn, and last over a month in perfection. The plants are small, and they grow slowly. They thrive best when potted in a mixture of peat and sphagnum in equal parts, with a sprinkling of silver-sand. The pots should be drained with limestone. They should be placed near the roof-glass in a tropical house, and in a lighter position than is required by the majority of species. Cochin China, &c., 1864. (B. M., t. 5513.)

Var. *Regnieri* has longer leaves, paler in colour, and scapes bearing three, sometimes five, flowers each.

C. Curtisii (*Rchb. f.*).—A handsome species, allied to *C. ciliolare.* The leaves are strap-shaped, about 8in. long,

Cypripedium.

light green, with darker mottlings. The scape is about 1ft. high, purplish, hairy; the flowers are large; dorsal sepal short, green, with a white margin, and purple and green nerves; lower sepals small; petals narrow, pointed, deflexed, dull green on the upper

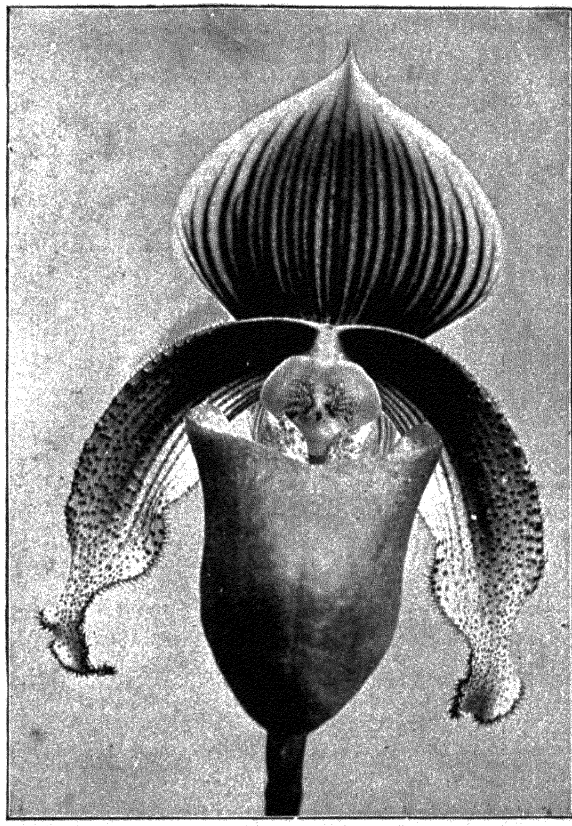


FIG. 46. FLOWER OF CYPRIPEDIUM CURTISII (nat. size).

half, white below, veined and spotted with purple, hairy on the margins; pouch large, helmet-shaped, with acute side angles, vinous purple, with blackish veins. The blossoms appear in May and June, and last a long time. This species should be

grown in a hot, moist house. Sumatra, 1882. (Fig. 46; W. O. A. iii., t. 122.)

C. Dayanum (*Rchb. f.*).—One of the prettiest of ornamental-leaved Orchids. It is dwarf and compact; the leaves are about 6in. long by 1½in. wide, and coloured yellowish-green, marbled with olive-green. Scape stout, 1ft. high, one-flowered; flowers 4in. across; dorsal sepal large, white, with green veins; lower sepals similar but smaller; petals narrow, fringed with long, black hairs, deep purple, shaded with dull green; pouch large, deep purple, veined with green. The flowers last a long time, usually appearing in May or June. It will be seen that the flowers are large and dark-coloured, but the most attractive character is the variegation of the leaves. Borneo, 1860. (Fl. des Ser., t. 1527.)

C. Druryi (*Bedd.*).—A stout-leaved, dwarf plant, with leaves 9in. to 1ft. long, green, somewhat rigid. Scape about 9in. high, brown, hairy, one-flowered; dorsal sepal broad, curved forwards, hairy on the outside, dull yellow, the midrib marked with a broad, black-brown band; lower sepal similar, but smaller; the petals are broad, curved downwards, yellow, with a line down the middle, as in the sepal, warted at the base; pouch pale yellow, spotted inside with purple. The flowers are developed in March or April, and they last over a month. This is one of the most distinctly marked species, and a remarkably pretty one when well flowered; but it is a shy-blossoming plant under cultivation. It requires tropical treatment. Travancore, 1875. (F. M., ser. ii., t. 425.)

C. Elliottianum (*O'Brien*).—A synonym of *C. Rothschildianum.*

C. Exul (*Rolfe*).—A cool-growing, but rather shy-flowering species. Flowers have the dorsal sepal white, yellow at the base, irregularly spotted with purple; petals resembling somewhat *C. insigne.* Lip like that of *C. Druryi.* Leaves resembling those of *C. Druryi*, but narrower and longer. Siam, 1892.

C. Fairieanum (*Lindl.*).—One of the prettiest of all Cypripediums, the form as well as the colour of the flowers being exceptionally attractive. The leaves are 6in. long, 1in. wide, and bright green. The scape is slender, pale green, 6in. high; the flowers are produced singly, usually during the autumn; the dorsal sepal is large and white, yellowish-green at the base, beautifully streaked with brownish-purple; petals similar in colour, fringed with black hairs, deflexed, and curiously curved at the ends; the pouch is dull purple, suffused

with dull brown, and veined with green. This plant seems to have become extinct in a wild state, as no new importations of it have been made, although it is one that is much sought after by cultivators. It is very rare in English collections, and, from its slowness of growth and impatience of division, is likely to remain so. It thrives best when placed in a warm, moist greenhouse, on a shelf near the glass, where it requires shade from sunshine. Assam, 1857. (Fig. 47; B. M., t. 5024.)

C. glanduliferum (*Blume*).—A striking and distinct plant, of recent introduction. It has stout, green leaves, like those of *C. Stonei*, and erect, many-flowered, hairy scapes; the dorsal sepal is 2in. long by 1¼in. wide, with the point arching forwards, whilst in colour it is creamy-white, with about a dozen purplish stripes; the petals are 5in. long, narrow, twisted, with black, hairy spots on the edge near the base, ochre-coloured, with a mid-line of brown; pouch 2in. long, slipper-shaped, shining yellowish-green, with red-brown nerves and blotches. It blossoms in August, and requires the same treatment as *C. Stonei*. New Guinea, 1886. Syn. *C. præstans*. (G. C., 1887, ii., fig. 155.)

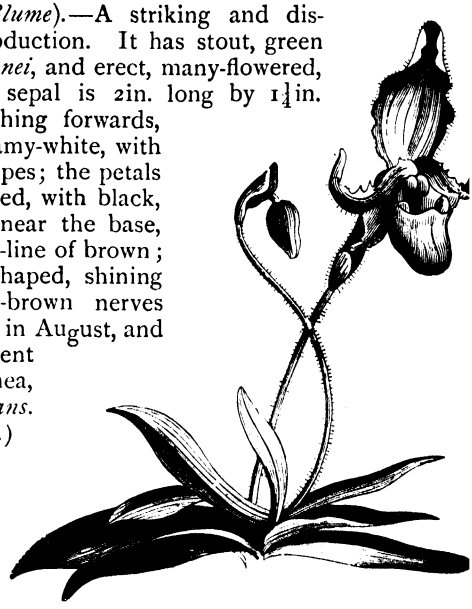


FIG. 47. CYPRIPEDIUM FAIRIEANUM (much reduced).

C. Haynaldianum (*Rchb. f.*).—A large-flowered, handsome species, related to *C. Lowii*. The leaves are 1ft. long, leathery, and green. The scapes are about 2ft. high, green, bearing two to six flowers; dorsal sepal oval, pale green, with blotches of brown at the base, rosy towards the apex; lower sepal large, green, with brown spots; petals oblong, 3in. in length, greenish-yellow, the margins of the upper part rose-tinted, the lower part twisted, blotched with brown; pouch green, tinged with purple. This is not one of the easiest of the Warm section to cultivate. It requires a hot, moist atmosphere, with plenty of water at the root during summer; and care must be taken to keep the

soil sweet and open. The flowers are developed in March. Philippine Islands, 1873. (B. M., t. 6296.)

C. hirsutissimum (*Lindl.*).—One of the most distinct and attractive species, flowering freely under ordinary treatment. It has green, strap-shaped leaves, about 9in. or 1ft. long, and scapes of the same length, bearing solitary flowers, which are very large, measuring at least 6in. across. The dorsal sepal is large, heart-shaped, reddish-purple, with a margin of clear green; lower sepal small, same colour; the back is densely covered with soft, blackish hairs; petals large, broad, tongue-shaped, twisted, hairy along the margins, narrowed and wavy at the base, deep purple and green; the pouch is large, helmet-shaped, deep green, shaded with purple. The flowers are produced freely in March or April, and they remain good on the plant for at least six weeks. This is one of the choicest of stove species. Assam, &c., 1857. (B. M., t. 4990.)

C. Hookeræ (*Rchb. f.*).—For the beauty of its foliage alone, this species deserves favour, whilst the flowers are not wanting in interest. The leaves are 6in. long, broad and obtuse, deep black-green, beautifully variegated with irregular blotches of creamy-yellow; the scapes are long, and one-flowered; the sepals and petals are yellowish-brown, the points of the latter being of a rich rosy-purple; the pouch is somewhat small, dark green, suffused with chocolate. It blossoms during the summer months. Borneo, 1862. This species was named in compliment to the late Lady Hooker. (B. M., t. 5362.)

C. insigne (*Wall.*).—One of the best known of all exotic Orchids, and also one of the easiest to cultivate. It was introduced, along with *C. venustum*, many years before any other species, and it still remains a useful and a handsome garden plant. It may be cultivated in a greenhouse, along with Geraniums. The leaves are about 9in. long, green; the scapes are 1ft. high, and bear a single flower 4in. across, and shining as if varnished; dorsal sepal large, oval, the apex bent forward, apple-green, with dull purple spots, and a white margin; lower sepal small, pale green; petals broad, spreading, wavy, pale green, with purple longitudinal lines; lip green and brown, paler near the mouth. It blossoms in December and January, the flowers lasting fully a month. Sylhet, 1820.

There are upwards of forty named varieties of this species, but not one-fourth of them are really distinct. The following are the best.

Var. *Chantini* has the dorsal sepal pure white on the apical half, with spots of a rich purple; petals with amber veins; pouch reddish-brown. Syn. var. *punctatum violaceum.*

Cypripedium.

Var. *Ernestii*, a yellow form of *C. insigne Chantini*. The purple spottings are indistinctly visible on the white, and the lower spots are indicated by green wart-like swellings. It is one of the most distinct as well as one of the rarest Cypripediums.

Var. *Harefield Hall*. This is the most gigantic of all. The spotting, too, is exceptionally large. One of the rarest and most expensive plants of the present day.

Var. *Maulei* is larger flowered, has less white on the dorsal sepal, and the petals and pouch are paler, than in *Chantini*.

Var. *Sanderæ* (Fig. 43) has flowers wholly primrose-yellow save the apical margin of the dorsal sepal, which is white, with a few brown dots.

Var. *Sanderiana* is smaller than *Sanderæ*, and has no spotting on the dorsal sepal.

Other distinct forms are: *Horsmanianum*, *Kimballianum*, and *Youngianum*. The last-named is commonly distributed in collections as *C. i. Ernestii*, but is altogether inferior to that variety.

C. lævigatum (*Batem.*).—A synonym of *C. philippinense*.

C. Lawrenceanum (*Rchb. f.*).—A very handsome species, remarkable for its large, attractive flowers, as well as for its richly-variegated foliage. It is a robust grower. The leaves are some 9in. long, 2in. broad, tessellated with yellow-green on a dark green ground, and very ornamental. Scapes 1ft. or more high, purple, hairy, usually one-flowered; dorsal sepal very large, spreading, white, with broad, parallel lines of brown-purple; petals spreading, 2½in. long by ½in. wide, green, tinged with purple at the apex, shaded with red at the base, the margins bearing a few purple, hairy warts; pouch large, almost cylindrical, purplish-brown, yellowish at the base. The blossoms are developed in summer. This plant should be included in every stove collection of Orchids. Borneo, 1878. (B. M., t. 6432.)

Var. *Hyeanum* differs in having the dorsal sepal white, with pale green lines; petals greenish-yellow, covered with short, dark hairs; and the pouch yellowish-green, with veins of a darker shade. It is an albino form of the type.

C. Lowii (*Lindl.*).—This prettily-marked species has been a great favourite ever since its first introduction. The leaves are upwards of 1ft. long, about 2in. broad, and pale green in colour. The scapes are from 2ft. to 3ft. long, and produce from two to five flowers, a greater number being noticeable upon wild specimens. They are about 4in. across, variously shaded with green, yellow, purple, or violet, and are also spotted with black or deep purple; the petals are long, twisted once, broadest at the apex, fringed on the margins, green, spotted

with purple at the base, purple at the apex; the pouch is helmet-shaped, shining purplish-green. The plant grows upon lofty trees in the thick jungles of Borneo and Sarawak, and was introduced in 1846. (Fl. des Ser., t. 375; W. O. A., t. 428.)

C. niveum (*Rchb. f.*).—A gem amongst Cypripediums. The leaves are small, dark green on the upper side, irregularly blotched with grey, the under side being of a dull vinous-red; the flowers are on erect scapes, from 3in. to 6in. high, solitary, or rarely produced in pairs, and pure, soft, snowy white, save for a few freckles of cinnamon irregularly scattered over the sepals and petals. The appearance of the plant, when not in flower, is very similar to that of *C. concolor*, the flowers of which are yellow. It blossoms during spring and summer, and remains in perfection about a month. It requires tropical treatment, and some broken limestone should be added to the peat and sphagnum used in potting. It is sometimes stated to be a native of Moulmein, but this is an error: the plant is a native of the Straits of Malacca, and is brought to Moulmein by the coasting steamers in exchange for Moulmein Orchids; it has also been received from the west coast of Siam. (B. M., t. 5922.)

C. pardinum (*Rchb. f.*).—A variety of *C. venustum pardinum.*

C. Parishii (*Rchb. f.*).—Although not to be reckoned amongst the most popular of Cypripediums, this is a really handsome plant. It somewhat resembles *C. philippinense* in general appearance, but is a more robust grower. The scape is sometimes as much as 2ft. in height, stout, hairy, occasionally branching, and it bears from three to six flowers; the sepals are broad, projecting forward, straw-coloured, with pale green veins; the petals are about 5in. long, undulated, green at the base, rich purple at the apex, and the margin bears purple, hairy warts; pouch long, green and purple. It blossoms in autumn, and requires tropical treatment. Burma, 1859. (B. M., t. 5791.)

C. philippinense (*Rchb. f.*).—This handsome species is related to *C. Stonei.* The leaves are strap-shaped, rather thick and fleshy, shining green, and about 1ft. long. The scape is erect, 1½ft. high, hairy, three- or four-flowered; flowers large; dorsal sepal broad, white, with purple stripes; lower sepal similar, but with green stripes, hairy externally; petals pendulous, 6in. long, narrow, spirally twisted, yellow at the base, green and white at the apex, the medial part covered with deep brown blotches and dark glandular spots; pouch small, greenish-yellow. The flowers are developed in April or May, and they last about

a month. Introduced from the Philippines, where it was found growing with *Vanda Batemanni*, in 1863. It requires tropical treatment. Syn. *C. lævigatum.* (B. M., t. 5508.)

C. præstans (*Rchb. f.*).—A synonym of *C. glanduliferum.*

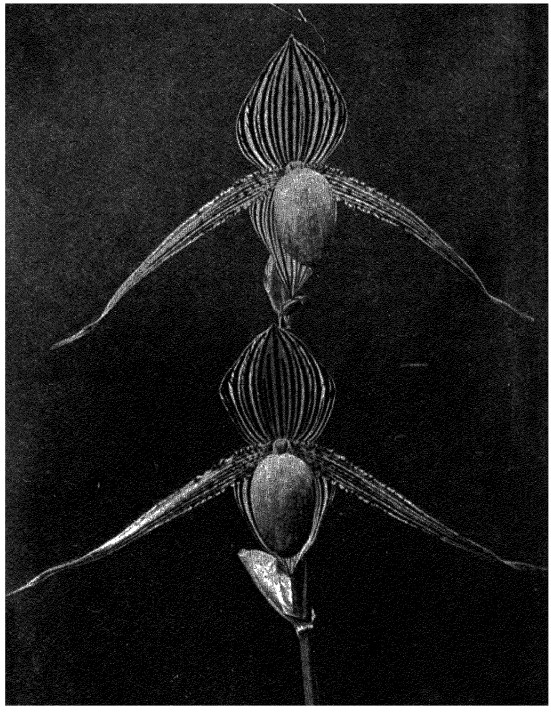


FIG. 48. FLOWER OF CYPRIPEDIUM ROTHSCHILDIANUM (much reduced).

C. purpuratum (*Lindl.*).—A pretty-leaved species, closely related to *C. barbatum.* Leaves 5in. long, pointed, pale green, marbled with a darker shade. Scape 6in. long, erect, one-flowered; flowers as in *C. barbatum,* but the dorsal sepal has revolute margins, and is pure white on the upper part, the rest being greenish, with purple stripes; the petals are broad, wavy, acute at the points, and ciliated, purplish, with black warts.

Cypripedium.

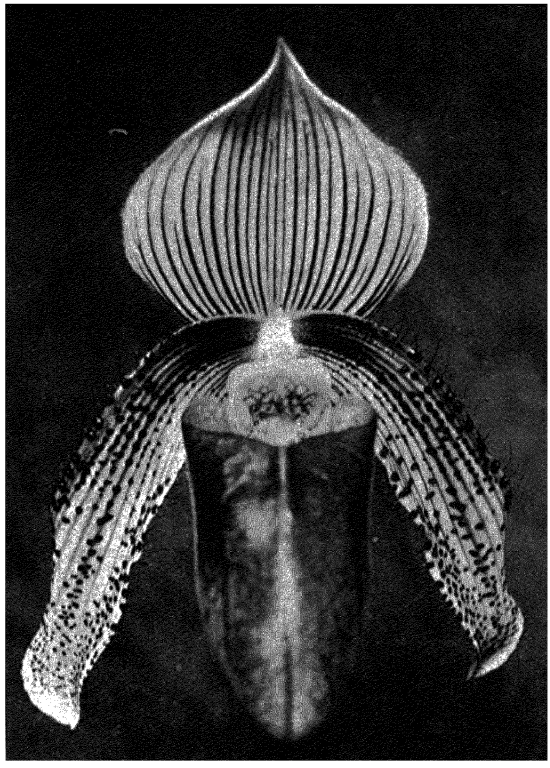
This is an easily-grown and free-flowering plant, blossoming in the winter. Hong Kong and China, 1836. (B. M., t. 4901.)

C. Rothschildianum (*Rchb. f.*).—One of the handsomest of the *C. Stonei* group. Prof. Reichenbach described it as being "one of the most astonishing introductions ever seen." It has stout, green, glossy leaves 2ft. long by 2½in. wide. Scape stout, 1ft. or more high, reddish, bearing three or more flowers, which are quite as large as those of *C. glanduliferum*; dorsal sepal oblong, acute at the apex, yellowish, with black-purple stripes and a white margin; petals narrow, wavy at the base, yellowish-green, with dark longitudinal lines and blotches; pouch as in *C. Stonei*, almost leathery in texture, cinnamon-coloured, reddish at the mouth. The staminode in this species is very remarkable; it is curved and formed not unlike a crane's beak and head. New Guinea, 1888. It requires the same treatment as *C. Stonei*. Syn. *C. Elliottianum*. (Fig. 48; B. M., t. 7102.)

C. Sanderianum (*Rchb. f.*).—A most remarkable and beautiful species. In habit and leaf-character it is similar to *C. philippinense*. Flower-scapes stout, erect, 1ft. or more high, black-purple and velvety, each bearing from one to four flowers, which are as large as those of *C. philippinense*; dorsal sepal triangular-concave, hairy outside, the front beautifully striped with brownish-crimson on a pale green ground; the petals, which form the most striking feature in the flower, are curved back at the base, and thence extend spirally downwards, ultimately lengthening to from 1½ft. to 2ft., as in *C. caudatum*; in colour they are crimson and white on the upper part, brown-crimson below; pouch small, narrow, dark brown. The flowers last at least six weeks in perfection. This interesting Cypripedium is apparently easily grown if treated as a tropical plant. It does well when grown under the same conditions as *C. Stonei*. Malay Archipelago, 1886. (R., t. 3.)

C. Spicerianum (*Rchb. f.*).—A beautiful and very distinct species, which has become one of the most popular of Orchids. The leaves are like those of *C. insigne*, but broader and shorter, and spotted with purple on the under side. The scape is hairy, purple, 9in. long, generally one-flowered; flowers 2½in. across, full, of good substance; dorsal sepal 2in. wide, green, and folded at the base, the rest pure white, tinged with rosy-violet, and having a stripe of purple from the apex to the base; lower sepal ovate, greenish; petals 2in. long, wavy along the margins, pale green, striped and spotted with purple; pouch large, open, dull purple; staminode large, disk-like, bright

purple, with a white edge. This very desirable plant will grow and flower freely in an intermediate-house, although it thrives perfectly in a stove. It blossoms from October to December, and the flowers last over a month. Assam, 1878. (B. M., t. 6490.)



(nat. size).

C. Stonei (*Low*).—This is a truly beautiful species, and although somewhat difficult to establish when newly imported, under ordinary care it grows tolerably quick, and forms a handsome specimen. The leaves are about 1ft. in length, leathery, obtuse at the ends, and dark shining green. The scape is about 2ft. long, erect, and usually three-flowered; the

sepals are large and broad, of a china-white hue, thinly striped with reddish-purple, and shaded with ochreous-yellow; the petals are 5in. to 6in. long, narrow, curved downwards and twisted, and are of the same colour as the sepals; the lip is large, and has a curious pouch, somewhat resembling a Turkish slipper in form; the ground-colour is dull red, with purple veins, whitish on the under side. It is a native of Sarawak, in Borneo, and in its specific name commemorates Mr. Stone, formerly gardener to Mr. John Day, of Tottenham, who flowered it for the first time in this country in 1860. It blossoms in autumn, and requires tropical treatment. (B. M., t. 5349.)

Var. *platytænium.*—A plant of exceptional interest and beauty. The petals are 1in. broad, white, tinted with yellow and blotched with purple; dorsal sepal white, with purple stripes. The highest sum ever paid for an Orchid, at a public auction sale, viz., 310 guineas, was given for a small plant of this variety by Baron Schroeder, in 1887. It first appeared in the collection of the late Mr. John Day, in 1867.

C. superbiens (*Rchb. f.*).—Undoubtedly the finest of the *C. barbatum* section, and it deserves a place in every collection. The leaves are 6in. long by 2in. broad, oblong and blunt at the apex, beautifully mottled with dark green upon a yellowish-green ground. The scape is 1ft. high, and bears a single very large flower; the dorsal sepal is large and broad, ciliated, white, beautifully streaked with purple and green; the petals are 3in. long, and nearly 1in. broad, white, green, and purple, the margin warted, fringed with soft hairs; the pouch is very large and prominent, of a uniform rich brown-purple, reticulated in front. It blossoms during summer, and lasts a long time in full beauty. It is a native of Java, and is regarded by some botanists as one of the many forms of *C. barbatum.* It was introduced in 1835. Syn. *C. Veitchianum.* (Fig. 49; Fl. des Ser., t. 1996.)

C. tonsum (*Rchb. f.*).—A robust-growing species, with tessellated foliage. Dorsal sepal whitish, covered with green nerves, a small brown blotch on each border inside, and a green disk outside; lower sepal half as long as the lip; petals green, washed with sepia, and spotted with dark brown; lip greenish, the upper surface washed with sepia. Sumatra, 1883. Allied to *C. javanicum,* but with the foliage marked as in *C. Dayanum.*

C. Veitchianum (*Hort.*).—A synonym of *C. superbiens.*

C. venustum (*Wall.*).—One of the first of the East Indian kinds to be introduced to English collections, having been

brought home about the year 1819. It is a very accommodating plant, for whilst some keep it entirely in the stove, others grow it in a greenhouse, the latter being preferable, as the blossoms are produced in greater abundance, although the variegation of the foliage is more brilliant where the plants are grown in a warm house. The leaves are short, of a dark bluish-green above, curiously mottled and blotched with grey-green, whilst the under side is dull purple. The flowers are solitary, and of medium size; the sepals and petals are greenish-white or pink, striped with bright green; the latter are fringed and warted with purple, and the pouch is yellowish-green, veined with olive-green and flushed with dull purple. It blossoms from January to March, and lasts a long time in perfection. It is a native of Sylhet and Nepal, and is perhaps as much valued for its handsomely-marked leaves as for its dark-coloured flowers. (B. M., t. 2129.)

Var. *pardinum* has larger foliage, which is also more distinctly marbled, and the flowers are clearer and brighter in colour.

Var. *Victoria Marie* (*Hort.*), closely allied to *C. Chamberlainianum*, but differing from it principally in its yellowish-tinted flowers and more robust habit.

C. villosum (*Lindl.*).—A well-known and handsome species, of robust habit and strong constitution. The leaves are leathery, from 1ft. to 1½ft. long, bright green above, paler below, and spotted with purple at the base. Scapes 1ft. long, very hairy, one-flowered; flowers large; dorsal sepal erect, oval, folded back at the base, the margin fringed with hairs, brownish-purple, the upper portion green, fading to white at the margin; lower sepal smaller, pale green; petals tongue-shaped, narrowed to a stalk at the base, 1in. wide in the broadest part, brownish-yellow, with a purple mid-rib; pouch large, open, brownish-yellow. The flowers are very freely produced from January to March, and remain fresh about a month. There are many variations from the type here described, some of the forms being considerably better than others. The varnish-like surface of the whole flower gives this species a very distinct appearance. Its nearest ally is *C. Boxallii*. It may be grown in an intermediate-house. Moulmein, 1853.

C. Wallisii (*Rchb. f.*).—A synonym of *Selenipedium caudatum Wallisii*.

The South American section will be found under **Selenipedium.**

Hybrids. The following is a list of Cypripedium and Selenipedium hybrids up to date, together with their recorded parentage as far as ascertainable:—

Cypripedium.

Abas *Stonei* and *villosum* (Veitch).
Abbess *Euryale* and *barbatum*.
Abraham Lincoln *Niobe* and *orphanum*.
Acis *Lawrenceanum* and *insigne Maulei* (Veitch).
Acteus *Leeanum* and *insigne Sanderæ* Veitch).
A. de Lacresse..... *Curtisii* and *Rothschildianum* (Sander).
A. Dimmock *Godseffianum* and *Druryi* (Sander).
Adonis..... *hirsutissimum* and *Curtisii* (Ingram).
Adrastus *Leeanum* and *Boxallii* (Veitch).
Æolus *philippinense* and *villosum* (Veitch).
Æsculapius *Lawrenceanum* and *Harrisianum* (R. I. Measures).
Æson *Druryi* and *insigne* (Veitch).
A. J. Harrington *Leeanum superbum* and *ænanthum superbum* (Sander).
Albert Hye Syn. *Lathamianum*.
Albertianum Syn. *Leeanum*.
Alcides..... *insigne* and *hirsutissimum* (Sander).
Alcides Cleo *insigne Chantinii* and *hirsutissimum* (Graves).
Alector..... *barbatum Crossii* and *Spicerianum* (Veitch).
Alfred *philippinense* and *venustum* (Drewett).
Alfred Bleu..... *ciliolare* and *insigne Chantinii* (Bleu).
Alfred Bleu..... *Crossianum* and *villosum* (Bleu).
Alfred Hollington *ciliolare* and *philippinense* (Hollington).
Alfred Truffaut..... *Harrisianum vivicans* and *Spicerianum* (Sander).
Alice *Spicerianum* and *Stonei* (Drewett).
Alice Gayot *Harrisianum* and *insigne* (Lebeuf).
Allanianum..... *Spicerianum* and *Curtisii* (Pitcher).
Allanianum superbum *Spicerianum* and *Curtisii* (R. I. Measures).
allertoniense *villosum* and *bellatulum* (Tate).
almos *villosum aureum* and *insigne* (Ebner).
almum *barbatum* and *Lawrenceanum* (Cookson).
Alonzo *Spicerianum* and *Arthurianum pulchellum* (Veitch).
Alport *Lawrenceanum Hyeanum* and *Rothschildianum* (Gratrix).
amabile *Boxallii* and *Dauthieri* (Page).
amabile *javanico-superbiens* and *Hookeræ* (Seeger).
amandum..... *insigne* and *venustum* (Warner).
Amesiæ Syn. *Mrs. F. L. Ames*.
Amesianum..... *villosum* and *venustum* (Williams).
amethystinum *villosum* and *Hookeræ* (Bleu).
Amœna..... Syn. *Surprise*.
Amphion..... *Harrisianum* and *Lawrenceanum* (R. H. Measures).
Andronicus..... Syn. *W. R. Lee* (R. H. Measures).
Angiliæ *callosum* and *Leeanum* (Martin).
annaerti *insigne* and *Ashburtonæ*.
Annamense..... *Ashburtonæ expansum* and *Numa* (Statter).
Anna Savage *Curtisii* and *Charles Canham* (Kimball).
Annie Ayling *Curtisii* and *concolor* (Hollington).
Annie Louise Syn. *Cowleyanum*.
Annie Measures *bellatulum* and *Dayanum* (Sander).
Antigone *Lawrenceanum* and *niveum* (Veitch).
Anton Jolly..... *vernixium* and *Spicerianum* (Jolly).
Aphrodite *niveum* and *Lawrenceanum* (Veitch).
apiculatum *Boxallii* and *barbatum* (Veitch).
Apollo *Stonei* and *vexillarium* (R. I. Measures).
Appletoniæ *Harrisianum* and *ciliolare* (Appleton).

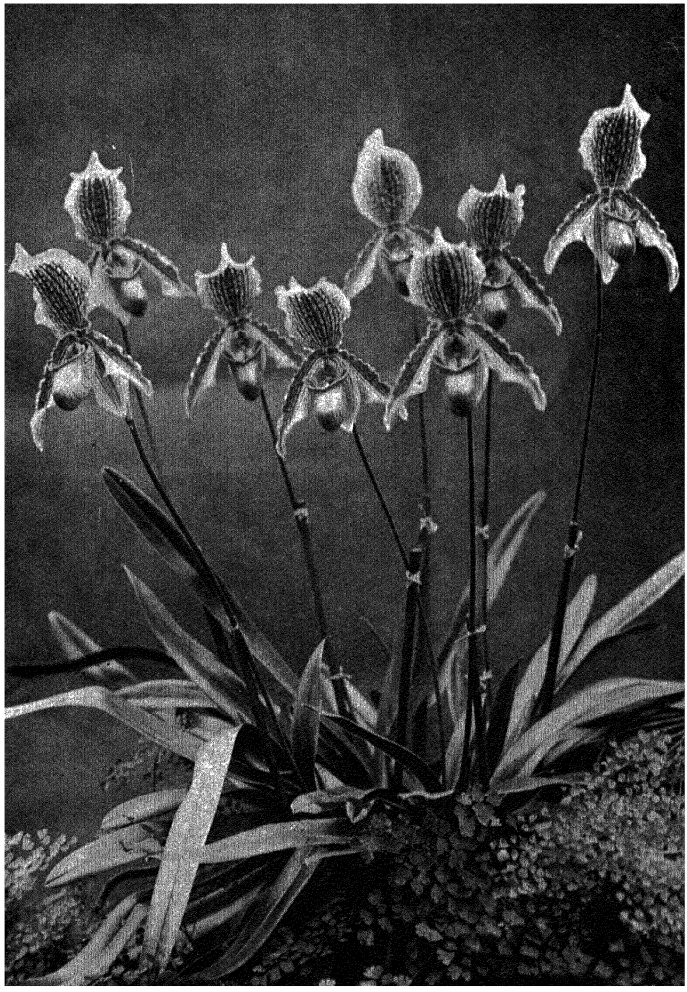


FIG. 50. CYPRIPEDIUM ARTHURIANUM
(much reduced).

Cypripedium.

Apuleus *Lathamianum* and *callosum* (Charlesworth).
Arete *Spicerianum* and *concolor* (Veitch).
Argo-Arthurianum .. *Argus* and *Arthurianum* (R. I. Measures).
Argo-callosum *Argus* and *callosum* (Cappi).
Argo-Morganiæ *Argus* and *Morganiæ* (Lawrence).
Argo-Spicerianum *Argus* and *Spicerianum* (Low).
Argo-Stonei *Argus* and *Stonei* (Cookson).
Ariadne *Spicerianum* and *selligerum majus* (Statter).
Arnoldiæ *bellatulum* and *superciliare* (Sander).
Arnoldianum *concolor* and *superbiens* (Pitcher).
A. R. Smith *callosum* and *Druryi* (Sander).
Artemis *Dayanum* and *Swanianum* (Veitch).
Arthur *venustum* and *philippinense* (Drewett).
Arthurianum (Fig. 50) *insigne* and *Fairieanum* (Veitch).
Arthurianum pulchellum *insigne Chantinii* and *Fairieanum* (Veitch).
Ashburtoniæ *barbatum* and *insigne* (Cross).
Ashburtoniodes Syn. *Pitcherianum.*
Ashtoni *ciliolare superbum* and *selligerum majus* (Lewis).
Ashworthiæ *Leeanum superbum* and *Spicerianum* (Sander).
Ashworthianum *Spicerianum* and *Crossii* (Sander).
Ashworthii *plunerum* and *Spicerianum* (Sander).
Aspasia *selligerum majus* and *tonsum* (Sander).
Aspasioides *selligerum majus* and *Argus* (Rothwell).
Astræa *philippinense* and *Spicerianum* (Veitch).
Atropos *Ashburtoniæ expansum* and *purpuratum* (Young).
atropurpureum *barbatum nigrum* and *Hookeræ* (Bleu).
Atys Syn. *Fitchianum.*
Augusta Syn. *Surprise.*
augustum *villosum* and *Haynaldianum* (Pitcher).
aurantiacum Syn. *Crossianum.*
aureum Syn. *Surprise.*
auricularum Syn. *vernixium.*
aurorum *Lawrenceanum* and *venustum* (Cookson).
Aylingii *niveum* and *ciliolare* (Hollington).
Ball, G. S. Syn. *radiosum.*
Balmedianum *Stonei* and *Fairieanum* (Lumsden).
barbato-bellum *barbatum Crossii* and *bellatulum* (Lawrence).
barbato-Charlesworthii *barbatum Warnerii* and *Charlesworthii* (Lumsden).
barbato-purpurato *barbatum* and *purpuratum* (Pitcher).
barbato-Veitchianum *barbatum* and *superbiens* (Bleu).
Barbayæ *Lawrenceanum* and *tonsum* (Jolibois).
Baron Schræder (Fig. 51) *ænanthum superbum* and *Fairieanum* (Veitch).
Bartetii *insigne Chantinii* and *barbatum* (Baeur).
Bartetii augustum *barbatum Crossii* and *insigne Kimballiana* (Pitcher).
Basileum *Druryi* and *Lawrenceanum* (R. H. Measures).
Batalinii *purpuratum* and *Argus* (Sander).
Beatrice *Boxallii* and *Lowii* (Drewett).
Beatrice Ashworth *Leeanum* and *venustum* (Ashworth).
Beechense *Curtisii* and *superbiens.*
Beeckmanii *Boxallii* and *bellatulum* (Linden).
Behrensianum *Io Grande* and *Boxallii* (Sander).
bellato-venustum *venustum* and *bellatulum* (Lord Burton).
bellato-vexillarium *bellatulum* and *vexillarium* (Briggs-Bury).

Cypripedium.

bellinum *vernixium* and *Harrisianum superbum* (Sander).
Bellona Syn. *Lathamianum.*
Bellune *superbiens* and *hirsutissimum* (Vuylsteke).
Belus *Harrisianum nigrum* and *Mastersianum* (Young).

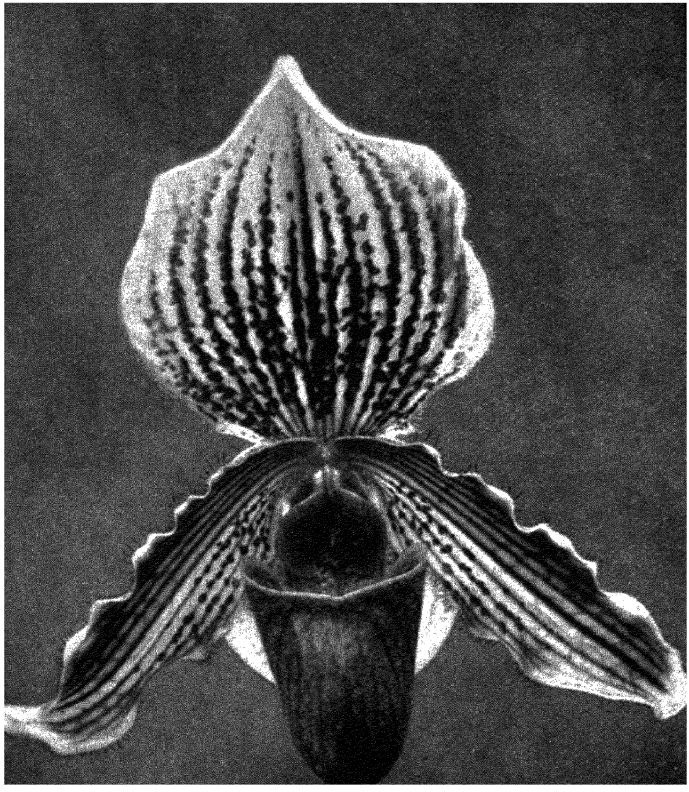


FIG. 51. FLOWER OF CYPRIPEDIUM BARON SCHRŒDER
(nat. size).

Berenice *philippinense* and *Lowii.*
Berggrenianum *insigne* and *Dauthieri* (Sander).
bijou *œnanthum* and *Lawrenceanum* (Ingram).
bingleyense *Charlesworthii* and *Harrisianum* (Keeling).
Bolerlaerianum *Dauthieri* and *Harrisianum* (Penwels).

Cypripedium.

Boltonianum *calophyllum* and *Lecanum superbum* (Sander).
Bonnyanum..... *villosum* and unknown (Bonny).
Bookerii *ciliolare* and *Spicerianum* (Lewis).

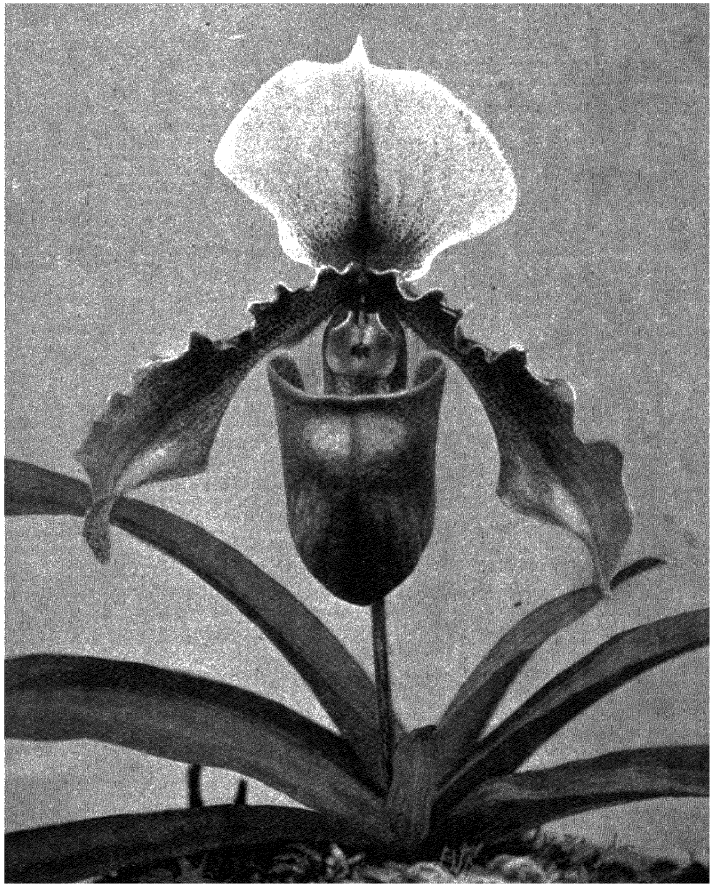


FIG. 52. CYPRIPEDIUM CERES
(nat. size).

Bosscherianum Syn. *Eyermanianum.*
Boulemyæ..... Syn. *Calypso.*
Boxallio-Rothschildianum *Boxallii* and *Rothschildianum* (R. I. Measures).

Cypripedium.

Boyleanum *Crossianum* and *Harrisianum* (Sander).
Bradshawianum..... Syn. *radiosum.*
Bragaianum Syn. *Godseffianum.*
Brayanum Syn. *Harrisianum.*
Brennus *œnanthum superbum* and *Harrisianum* (R. H. Measures).
Brunianum *Leeanum* and *œnanthum superbum* (Sander).
Bruno *Spicerianum* and *Leeanum* (Veitch).
Bryan *philippinense* and *Argus* (Cookson).
Buchanianum *Druryii* and *Spicerianum* (Buchan).
Burberryanum *Boxallii* and *plunerum* (Sander).
Burbidgeanum *Dayanum* and *concolor.*
burfordiense *Argus* and *philippinense* (Lawrence).
Burtonii *Lowii* and *Hookeræ* (Burton).
Cahuzac *Spicerianum* and *Haynaldianum* (Sander).
Calanthum *barbatum Warnerii* and *Lowii* (Veitch).
caligare *venustum* and *Dayanum* (Veitch).
Calliope *callosum* and *Lathamianum* (Clarke).
callo-bellum *callosum* and *bellatulum* (Lawrence)
calloso-Argus *callosum* and *Argus.*
calloso-barbatum..... *callosum* and *barbatum* (Charlesworth).
calloso-niveum..... *callosum* and *niveum* (R. H. Measures).
calloso-Rothschildianum *callosum* and *Rothschildianum* (Fowler).
calophyllum..... *barbatum* and *venustum* (Williams).
Calypso..... *Spicerianum* and *Boxallii* (Veitch).
Cambridgeanum..... *Harrisianum* and *insigne punctatum violaceum* (R. I. Measures).
Captain Holford..... *superbiens* and *hirsutissimum* (Veitch).
Captain Lendy *Boxallii* and *Charles Canham* (Ingram).
Cardosoanum *barbatum Warnerii* and *Leeanum* (Peeters).
Carl Peeters..... Syn. *Charles Rickman.*
Carnusianum *Haynaldianum* and *Spicerianum* (Carnuse).
Carrierii *superbiens* and *venustum* (Carrier).
Cassiope *venustum* and *Hookeræ* (Seeger).
Castleanum *hirsutissimum* and *superbiens* (Sander).
Cecilia Syn. *Maynardii.*
Celeus Syn. *nitens.*
Celia..... *Spicerianum* and *Lowianum* (Low).
Ceres (Fig. 52)..... *hirsutissimum* and *Spicerianum* (Drewett).
Chamber-Leeanum.... *Chamberlainianum* and *Leeanum* (Van Gert).
Chantino-ciliolare *insigne Chantinii* and *ciliolare* (Bleu).
Chantino-Regnieri.... *insigne Chantinii* and *concolor Regnieri* (Bleu).
Chapmanii *Curtisii* and *bellatulum* (R.I. Measures).
Chapmanii magnificum (Fig. 53) *bellatulum* and *Curtisii* (R. I. Measures).
Charles Canham..... *villosum* and *superbiens* (Veitch).
Charles Gonndoin *insigne Chantinii* and *vernixium* (Jolibois).
Charles Reffold *œnanthum superbum* and *Spicerianum* (Ingram).
Charles Rickman *bellatulum* and *barbatum* (Rickman).
Charles Steinitz *philippinense* and *Lawrenceanum* (Sander).
Charlesianum *Sallieri* and *Leeanum superbum.*
Charpinianum *Spicerianum* and *Morganiæ.*
chelseense *Lowii* and *barbatum Warnerii* (Bull).
chloroneuron..... *barbatum* and *venustum* (Warner).
chrysocomes..... *caudatum* and *conchiferum* (Seeger).
cilio-villosum *ciliolare* and *villosum* (Lewis).

Cypripedium.

claptonienſe Syn. *nitens.*
Claudii *Spiceriánum* and *vernixium.*
Clement Loury *Harrisianum* and *insigne Chantinii* (Jolibois).
Clement Moore *Dauthieri* and *Leeanum* (Sander).
Cleopatra *Hookeræ* and *œnanthum ſuperbum* (Winn).
Clinkaberryanum *philippinenſe* and *Curtiſii.*
Clothilde Moens *Leeanum ſuperbum* and *Haynaldianum* (Moens).
Clotho *Pollettianum* and *Boxallii atratum* (Young).

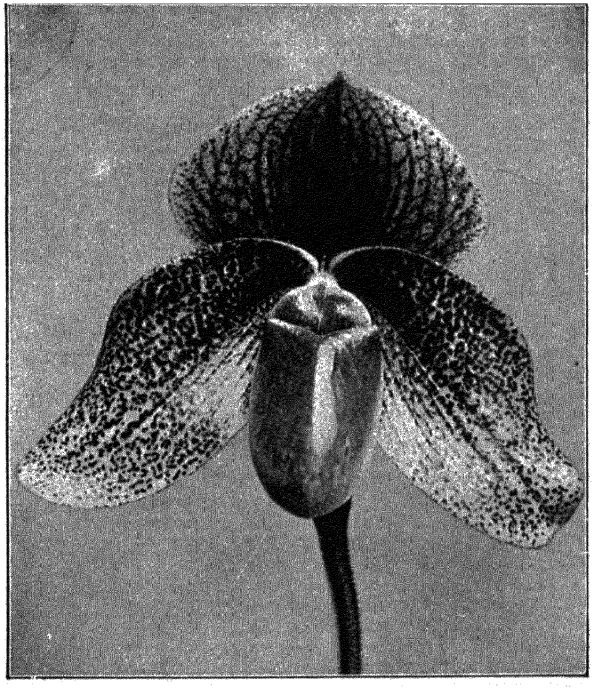


FIG. 53. FLOWER OF CYPRIPEDIUM CHAPMANII MAGNIFICUM (nat. size).

Clovenfordsi *ſuperbiens* and *philippinenſe* (Thompson).
Cobbiæ *Mrs. Charles Canham* and *J. Howes* (Cobb).
Cobbiana *Lawrenceanum* and *Sallieri* (Cobb).
Colmanii Syn. *Eismannianum.*
Comet *Stonei* and *ſuperciliare* (Sander).
Comte Andre de Germiny *Swanianum* and *Rothſchildianum* (Sander).
Comus *insigne maximum* and *Swanianum* (Graves).
concinnum *vullosum* and *purpuratum* (Bull).

Cypripedium.

conco-bellatulum..... *concolor* and *bellatulum* (Statter).
conco-callosum..... *concolor* and *callosum* (R. H. Measures).
conco-Lawre..... *concolor* and *Lawrenceanum* (Lawrence).
conco-villosum..... *concolor* and *villosum* (Sander).
conspicuum *Harrisianum* and *villosum* (Swan).
Constableanum *Fairieanum* and *Dayanum* (Pitcher).
Constance *Curtisii* and *Stonei* (Drewett).
Cooksoni Syn. *almum*.
corbeillense *Bullenianum* and *insigne* (Maron).
Corndeanii *Lawrenceanum* and unknown (Swinburne).
Corningianum..... Syn. *Youngianum*.
Cowleyanum..... *Curtisii* and *niveum* (Tautz).
Cravenianum *bellatulum* and unknown (Schofield).
Creon *Harrisianum superbum* and *ænanthum superbum* (Veitch).
Cretheus *Argus* and *Spicerianum* (Veitch).
Crossianum..... *insigne* and *venustum* (Ashburton).
Cupid *cardinale* and *Lindleyanum* (Veitch).
Cybele *Druryi* and *Lawrenceanum* (Pitcher).
Cydippe *superbiens* and *Hookeræ* (Veitch).
Cymatodes *Curtisii* and *superbiens* (R. H. Measures).
Cyris..... *Boxallii atratum* and *Argus* (Cookson).
Cythera..... *Spicerianum* and *purpuratum* (R. H. Measures).
Dædalus *insigne punctatum violaceum* and *vexillarium superbum* (Young).
Daisyæ *Lowii* and *ænanthum superbum* (Graves).
Dauthieri..... *barbatum* and *villosum* (Van Houtte).
Davisianum..... Syn. *Cyris*.
Dayano-Curtisii..... *Dayana* and *Curtisii* (Graves).
Debosscherianum Syn. *Eyermanianum*.
decorum *Sallieri Hyeanum* and *Lawrenceanum* (Hye).
Deedmanianum *Spicerianum* and *Chamberlainianum* (Latham).
delicatulum..... *Dayanum* and *barbatum Warnerii* (Drewett).
Dennisianum *superbiens* and *selligerum majus* (Linden).
Desboisianum..... *venustum* and *Boxallii atratum* (Vervaet).
De Witt Smith *Spicerianum* and *Lowii* (Low).
Diana Syn. *Eyermanianum*.
Dibdin..... Syn. *Cyris*.
Diolare..... *villosum* and *venustum* (Cookson).
discolor..... *venustum* and unknown (Williams).
Donatianum *Harrisianum* and *insigne Wiottii* (Sander).
Doncasterianum *hirsutissimum* and *callosum* (Sander).
Dora Crawshaw..... *Charlesworthii* and *bellatulum* (Charlesworth).
Doris *venustum* and *Stonei* (Cookson).
Dowlerianum..... *insigne punctatum violaceum* and *leucochilum* (Appleton).
Driherianum Syn. *Leander*.
Dr. Conway *Exul* and *callosum* (Wellesley).
Dr. Ryan Syn. *Deedmanianum*.
Drurio-Hookeræ..... *Hookeræ* and *Druryi* (Veitch).
Drurio-Lawrenceanum *Lawrenceanum* and *Druryi* (Veitch).
Drurio-villosum..... *villosum* and *Druryi* (Veitch).
Dubium *Boxallii* and *venustum*.
Duchess of Sutherland *Youngianum* and *Rothschildianum* (Sander).
E. Ashworth *plunerum* and *Spicerianum* (Sander).
Echo *Hookeræ* and *insigne Chantinii* (Graves).

Cypripedium.

Edith Winn *Stonei* and *purpuratum* (Winn).
Edwardii..... *Fairieanum* and *superbiens* (Pitcher).
Edward Jolibois..... *insigne Maulei* and *barbatum* (Jolibois).
E. Holt *Curtisii* and *Præstans* (Sander).
Eismannianum *Boxallii* and *Harrisianum* (Seeger).
Electra Syn. *ænanthum*.
elegans Syn. *Harrisianum*.
Elinor *selligerum majus* and *superbiens* (Drewett).
Elizabethæ *Lawrenceanum* and *Parishii* (R. H. Measures).
Endymion *barbatum* and *Mastersianum* (Young).
enfieldense *Lawrenceanum* and *Hookeræ* (Hollington).
Englehardtæ Syn. *Leeanum*.
Enid *bellatulum* and *Spicerianum* (Rothschild).
Ensign *Harrisianum* and *barbatum biflorum* (Winn).
Eos *niveum* and *Charlesworthii* (Appleton).
Ephialtes *insigne Chantinii* and *aurorum* (Pitcher).
Erato *Sallieri* and *hirsutissimum*.
Eros *barbatum Warnerii* and *Charles Canham* (Wills).
Erycina Syn. *Pitcherianum*.
Etienne Jolibois *insigne Maulei* and *hirsutissimum* (Jolibois).
Etiocle Syn. *Surprise*.
Eucharis *insigne Chantinii* and *Lawrenceanum*.
Euphrosyne..... Syn. *Ariadne*.
Euryades *Leeanum* and *Boxallii* (Veitch).
Euryale *Lawrenceanum* and *superbiens* (Veitch).
Euryandrum *barbatum* and *Stonei* (Veitch).
Eurydice *Hookeræ* and *Spicerianum* (Graves).
Eurydice *hirsutissimum* and *Leeanum* (Vuylsteke).
Eurylochus *ciliolare* and *hirsutissimum* (Veitch).
Euterpe *venustum* and *philippinense* (Statter).
Evelyn Ames *Leeanum* and *Calypso* (Ames).
Evenor..... *concolor* and *Argus* (Veitch).
Excelsior..... Syn. *Buchanianum* (Hye).
Excelsior..... *Rothschildianum* and *Harrisianum* (Statter).
Eyermanianum *barbatum grandiflorum* and *Spicerianum* (Sander).
Eyermanianum Diana *barbatum superbum* and *Spicerianum magnificum* (R. H. Measures).
Eyermanianum Hermione..... *barbatum Warnerii* and *Spicerianum* (Young).
Fairieano-Lawrenceanum *Lawrenceanum* and *Fairieanum* (R. H. Measures).
Fairy Queen *Curtisii* and *Druryi* (Sander).
Fascinator Syn. *Ceres*.
Fausianum *Dauthieri* and *calophyllum* (Sander).
Favager *Charlesworthii* and *concinnum* (Rehder).
Felicity..... *callosum* and *tonsum* (Pitt).
Felix Faure..... *Godefroyæ* and *callosum* (Dellamagne).
Felix Jolibois Syn. *ænanthum*.
festum *chloroneuron* and *barbatum Warnerii* (Seeger).
Figaro *Spicerianum* and *ænanthum* (Seeger).
Finetianum *philippinense* and *ciliolare* (Seeger).
Fitchianum *Hookeræ* and *barbatum* (Williams).
Flamingo Syn. *Calypso*.
Flora..... Syn. *Calypso*.
Fordianum *Stonei* and *callosum* (Sander).
Fortuna *Hookeræ* and *callosum* (Young).

Cypripedium.

Fournierianum *insigne Maulei* and *Lawrenceanum* (Sander).
Fowlerianum *Harrisianum* and *bellatulum* (Sander).
Francois Peeters Syn. *Charles Rickman.*
Fraseri *hirsutissimum* and *barbatum* (Veitch).
Frau Ida Brandt *Io grande* and *Youngianum* (Sander).
Frederico Nobile *Boxallii* and *Morganiæ* (Seeger).
F. S. Roberts *niveum* and unknown (Low).
fulgens *marmarophyllum* and *Hookeræ* (Sander).
Furzianum *callosum* and *hirsutissimum* (Sander).

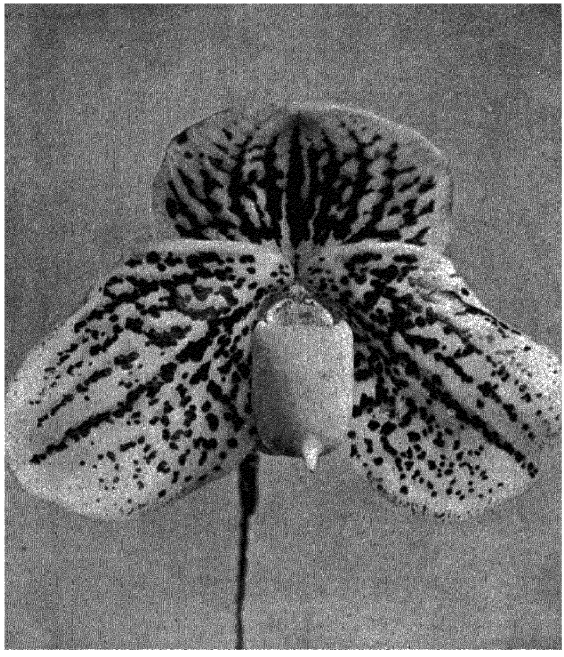


FIG. 54. FLOWER OF CYPRIPEDIUM GODEFROYÆ LEUCOCHILUM (nat. size).

Gabrali *orphanum* and *Dauthieri* (Gabral).
Galatea Syn. *ænanthum.*
gandavense *barbatum* and *Swanianum.*
Ganymedes *tonsum* and *ænanthum superbum.*
Garbari *Lawrenceanum* and *Rothschildianum* (Sander).
Garret A. Hobart *Lathamianum* and *insigne Chantinii* (Roebling).
Gaskelliana Syn. *Niobe.*
gemmiferum *Hookeræ* and *purpuratum* (Veitch).
General French *Swanianum* and *bellatulum.*

Cypripedium.

Genesa	*Sallieri Hyeanum* and *Lawrenceanum Hyeanum* (R. I. Measures).
George Kettle	*Dayanum* and *superbiens* (Kettle).
George Truffaut	*ciliolare* and *Stonei* (Sander).
Georgianum	*superbiens* and *niveum* (Graves).
Germain Sciller de Gisors	Syn. *œnanthum*.
Germinyanum	*villosum* and *hirsutissimum* (Veitch).
Gertrude	Syn. *Miss Louisa Fowler*.
Gertrude Hollington	*ciliolare* and *bellatulum* (Hollington).
G. H. Rodgers	*insigne punctatum violaceum* and *superbiens* (Williams).
Gibezranum	Syn. *Measuresianum*.
giganteum	*Harrisianum* and *Sallieri Hyeanum* (Hye).
gigas	*Lawrenceanum* and *Harrisianum* (Ingram).
Gillianum	Syn. *Hera*.
gloriosum	Syn. *gigas*.
Godefroyæ (Fig. 54)	*bellatulum* and *niveum* (also nat. hyb.) (Strickland).
Godseffianum	*Boxallii* and *hirsutissimum* (Cookson).
Goultenianum	*Curtisii* and *callosum* (Goulten).
Gowerianum	*Curtisii* and *Lawrenceanum* (Sander).
gracile	*Haynaldianum* and *Swanianum* (Ingram).
Gratrixiæ	*vexillarium* and *bellatulum*.
Gravesiæ	*Argus* and *niveum* (Graves).
Gravesianum	*Lathamianum* and *Leeanum* (Sander).
Greyanum	*Druryi* and *ciliolare* (Pitcher).
G. S. Ball	Syn. *radiosum*.
Harri-Leeanum	*Harrisianum* and *Leeanum* (Clarke).
Harri-Sander	*Harrisianum* and *Sanderianum* (Clarke).
Harrisiano-nitens	*Harrisianum* and *nitens*.
Harrisianum	*villosum* and *barbatum* (Veitch).
Harvyanum	*Stonei* and *Leeanum* (Backhouse).
Harrisi-froyæ	*Harrisianum* and *Godefroyæ* (Lawrence).
Hayetti	Syn. *Ledouxiæ*.
Haynaldiano-Hookeræ	*Haynaldianum* and *Hookeræ*.
Haynaldo-bellatulum	*Haynaldianum* and *bellatulum* (Clarke).
Haynaldo-Chamberlainianum	*Haynaldianum* and *Chamberlainianum* (Ashworth).
Hebe	Syn. *Alice*.
Hecla	*superbiens* and *Swanianum* (Ingram).
Helia	*Dayanum* and *Charlesworthii* (Wigan).
Helia II.	*bellatulum* and *insigne Chantinii* (Lunstell).
Heloise Mantin	*gemmiferum* and *Boxallii* (Mantin).
Helvita	*Chamberlainianum* and *philippinense* (Leeman).
H. E. Moojen	*Hookeræ volontianum* and *Harrisianum* (R. H. Measures).
Henri van der Straten	*Mrs. Charles Canham* and *Leeanum* (Sander).
Henry Ballantine	*purpuratum* and *Fairieanum* (Veitch).
Henry Graves, jun.	*Lawrenceanum* and *Marshallianum* (Graves).
Hera (Fig. 55)	*Boxallii* and *Leeanum* (R. H. Measures).
Hermione	Syn. *Eyermanianum*.
Hero	*villosum* and *Boxallii*.
Hiero	*Chamberlainianum* and *Lawrenceanum* (Veitch).
highfieldense	*Lawrenceanum* and *Druryi* (Barton).
hirsuto-Sallieri	*hirsutissimum* and *Sallieri* (Lawrence).
hirsuto-villosum	*hirsutissimum* and *villosum* (Cappi).

Cypripedium.

Hitchingsæ *Charlesworthii* and *insigne* (Hitchings).
Hobsonii.. *philippinense* and *callosum* (Hollington).
Hollidayanum..... *concolor* and *almum* (Sander).
Hookerii-Veitchii *Hookeræ* and *superbiens* (Williams).
Hornerii Syn. *Cyris*.
Hornianum *superbiens* and *Spicerianum* (Sander).
Hurrellianum..... *Argus* and *Curtisii* (Pitcher).
Huybrechtsianum Syn. *Ceres*.

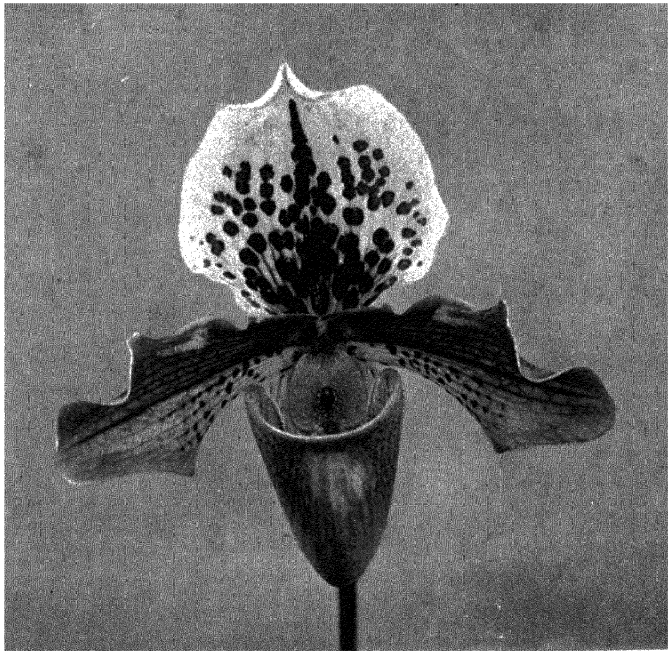


FIG. 55. FLOWER OF CYPRIPEDIUM HERA
(nat. size).

hybridum..... *villosum* and *barbatum*.
Iago *Dayanum* and *villosum* (Wrigley).
I'Ansoni *Morganiæ* and *Rothschildianum* (Low).
Ianthe *Harrisianum* and *venustum* (Veitch).
imperatrix *Ashburtoniæ expansum* and *calophyllum* (Sander).
imperiale Syn. *Madame Jules Hye*.
Indra *callosum* and *villosum* (R. I. Measures).
Ino *Haynaldianum* and *Mrs. Charles Canham* (Grey).
Iphis..... *tonsum* and *Argus*.
insigne-tonsum *insigne* and *tonsum* (Sander).

Cypripedium.

inspirator Syn. *Madame Jules Hye.*
intermedium Syn. *hybridum.*
inversum *villosum* and *superbiens.*
Io *Argus* and *Lawrenceanum* (Sander).
Iocasta *Haynaldianum* and *insigne Chantinii* (Veitch).
Io grande *Argus* and *Lawrenceanum* (Sander).
Ionides Syn. *Behrensianum.*
Io-Spicerianum *Io* and *Spicerianum* (Robins).
Iris *javanico-superbiens* and *ciliolare* (Bleu).
Isabelliæ *Spicerianum* and *niveum* (Williams).
Jacobianum *Crossianum* and *bellatulum* (Le Roy).
James Buckingham .. *enfieldense* and *bellatulum* (Hollington).
Jamesonianum *Leeanum* and *Arthurianum* (Statter).
Janet *Spicerianum* and *glanduliferum* (Veitch).
Janet Ross *Swanianum* and *Harrisianum* (Ross).
Janus *Spicerianum* and *vexillarium* (R. I. Measures).
javanico-insigne *javanicum* and *insigne* (Pitcher).
javanico-Spicerianum *javanicum* and *Spicerianum* (Page).
javanico-superbiens.... *javanicum* and *superbiens* (Bleu).
J. Bartels *Boxallii* and *callosum* (Sander).
J. Coles *Godefroyæ leucochilum* and *Dayanum* (R. H. Measures).
Jeanette *niveum* and *Leeanum* (Charlesworth).
Jensenianum *hirsutissimum* and *vexillarium* (Sander).
J. Gurney Fowler *Godefroyæ* and *barbatum* (Low).
J. H. Berry *Harrisianum superbum* and *concolor* (Sander).
J. Howes *Sallieri* and *villosum* (Cobb).
J. H. Veitch *Curtisii* and *Stonei platytænium* (Veitch).
James K. Polk *nitens* and *Chamberlainianum* (Roebling).
John Carder *selligerum majus* and *hirsutissimum* (Sander).
Johnsonii *nitens magnificum* and *Lawrenceanum* (Sander).
Jolien Coffegnez Syn. *Ianthe.*
Joseph Donat *Ashburtoniæ* and *Spicerianum* (Sander).
Josephianum *Druryi* and *javanico-superbiens* (Pitcher).
Josephine Jolibois Syn. *ænanthum.*
Juliæ *Lawrenceanum* and *Exul.*
Juno *Fairieanum* and *callosum* (Cookson).
Jupiter Syn. *Godseffianum.*
Kaloc *barbatum* and *Argus* (R. I. Measures).
Kerchovianum *Curtisii* and *barbatum.*
Kimballianum..... *Rothschildianum* and *Dayanum* (nat. hyb.).
Kirchoffianum *Dauthieri* and *Spicerianum* (Seeger).
Kramerianum *ænanthum* and *villosum* (Sander).
Krishna *insigne* and *tonsum* (Graves).
Krousianum *Spicerianum* and *Crossianum* (Pitcher).
Kubele *ænanthum superbum* and *Youngianum* (Young).
Lachesis *Crossianum* and *marmarophyllum* (Young).
Lachmee *ciliolare* and *superbiens* (R. I. Measures).
Lady Hutt *insigne* and *Fitchianum* (Swinburne).
Lady Isabel *Rothschildianum* and *Stonei* (Sander).
Lady Maple..... *Youngianum* and *Gowerianum* (Sander).
Lady Roberts *Harrisianum* and *niveum.*
Lady Wimborne Syn. *Leander.*
lævigato-purpurato .. *philippinense* and *purpuratum.*
læforcadei *barbatum* and *insigne punctatum violaceum Godefroyæ.*
La France *nitens* and *niveum* (Seeger).

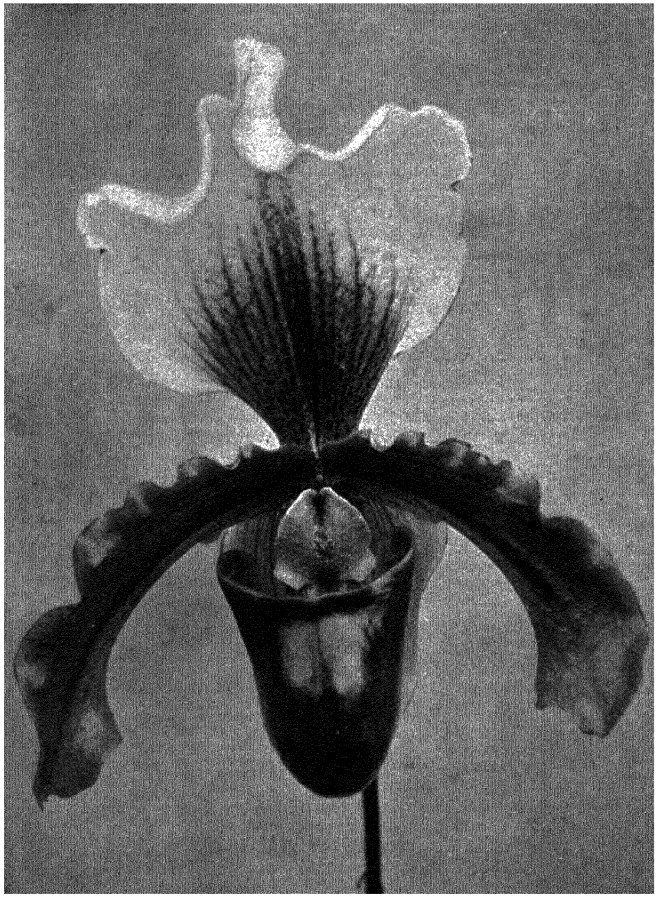


FIG. 56. FLOWER OF CYPRIPEDIUM LEEANUM GIGANTEUM

(nat. size).

Cypripedium.

La Nymphe *ænanthum* and *Dauthieri* (Ingram).
Lathamianum *Spicerianum* and *villosum* (Latham).
latiflorum *venustum* and *philippinense* (Statter).
Laucheanum *barbatum* and *insigne amabile* (Sander).
Lauriæ *villosum* and *superciliare* (Le Doux).
Lawre-bel *Lawrenceanum* and *bellatulum* (Lawrence).
Lawre-concolor *Lawrenceanum and concolor* (Sander).
Lawre-venustum *Lawrenceanum* and *venustum*.
Lawrenceano-Curtisii *Lawrenceanum* and *Curtisii* (Bleu).
Lawrenceano-Druryi .. *Lawrenceanum* and *Druryi* (Veitch).
Lawrenceano-Fairie-anum *Lawrenceanum* and *Fairieanum* (R. H. Measures).
Leander *Leeanum* and *villosum* (R. H. Measures).
Leander Cambridge Lodge var. *Leeanum giganteum* and *villosum aureum* (R. I. Measures).
Lebaudyanum *philippinense* and *Haynaldianum* (Page).
Leda *Harrisianum* and *venustum* (Bowring).
Ledouxiæ *callosum* and *Harrisianum* (Le Doux).
Leeanum *insigne* and *Spicerianum* (Lawrence).
Leeanum-Chamberlain-ianum *Leeanum* and *Chamberlainianum*.
Leeanum-Galatea *Leeanum* and *Galatea* (Sander).
Leeanum giganteum (Fig. 56) *insigne* and *Spicerianum* (Cypher).
Leeanum-Morganiæ .. *Leeanum* and *Morganiæ* (R. I. Measures).
Leo Syn. *Lathamianum* (Hye).
Leo *Wallertianum* and *insigne Chantinii*.
Leonæ *insigne Chantinii* and *callosum* (Leon).
Leonides Syn. *St. Mark*.
Leopoldianum *Leeanum superbum* and *insigne* (Hye).
Leopoldianum *Sallieri Hyeanum* and *hirsutissimum* (Vuylsteke).
lepidum Syn. *Tautzianum*.
Leysenianum Syn. *Charles Rickman*.
Lily *niveum* and *bellatulum* (Keeling).
Lily Measures *niveum* and *Dayanum* (R. H. Measures).
Littleanum *Lawrenceanum* and *Dayanum* (nat. hyb.) (Little).
Lloydeæ Syn. *Said Lloyd*.
Lobengula *insigne Chantinii* and *Harrisianum*.
Loewegrianum *Spicerianum* and *Io grande* (Sander).
Loochrystianum *Harrisianum* and *Hookeræ* (Vuylsteke).
Lord Derby (Fig. 57).. Syn. *W. R. Lee*.
Lord Roberts *Charl sworthii* and *Creon* (Charlesworth).
Louisæ *Leeanum* and *Ashburtoniæ* (Le Doux).
Louryanum *Ashburtoniæ* and *vernixium* (Sander).
Louryi *insigne Chantinii* and *Harrisianum*..
Lowryenianum *Io grande* and *Spicerianum* (Sander).
Lowii-superbiens *Lowii* and *superbiens* (Lawrence).
lucidum *Lowii* and *villosum* (R. I. Measures).
Lucie *Lawrenceanum* and *ciliolare*.
Lucienianum Syn. *nitens*.
luridum *Lawrenceanum* and *villosum* (Pitcher).
lutescens *Spicerianum* and *javanicum* (Pitcher).
Lynchianum *Spicerianum* and *selligerum majus* (Sander).
Mabeliæ Syn. *W. R. Lee*.
Macfarlainei *calophyllum* and *Spicerianum* (Sander).
MacNabbianum Syn. *conco-callosum*.

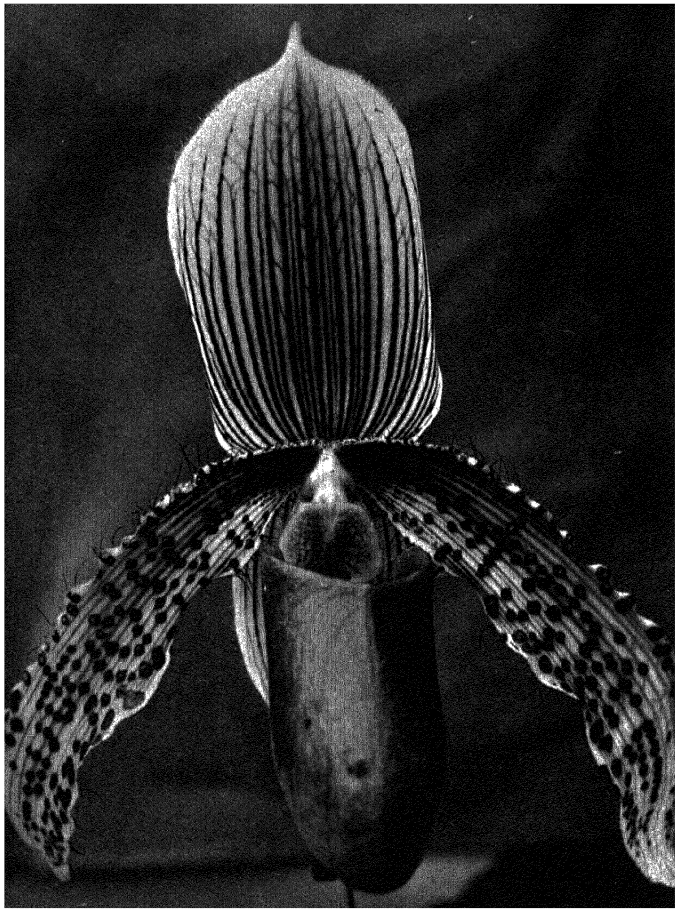


FIG. 57. FLOWER OF CYPRIPEDIUM LORD DERBY

(much reduced).

Cypripedium.

macropterum *Lowii* and *superbiens* (Veitch).
maculatum *tonsum* and *Leeanum* (Sander).
Madame Barbary *Lawrenceanum* and *tonsum* (Jolibois).
Madame Cappi *Spicerianum* and *Dauthieri* (Cappi).
Madame Coffinet..... *superciliare* and *Dayanum* (Opoix).
Madame C. Goindoin .. Syn. *œnanthum.*
Madame de Curte Syn. *Mons. de Curte.*
Madame Else Descombes *vernixium* and *Lawrenceanum* (Opoix).
Madame Emile Gayot.. *Harrisianum* and *insigne Chantinii.*
Madame Gabriel Moens *Spicerianum* and *callosum.*
Madame Gibez..... *villosum* and *venustum.*
Madame G. Truffaut.. *Morganiæ* and *Stonei* (Sander).
Madame Jules Hye.... *Spicerianum* and *tonsum* (Hye).
Madame Louise Doin.. *purpuratum* and *insigne* (Opoix).
Madame Margaret Hye Syn. *Surprise.*
Madame Octave Opoix *superciliare* and *niveum* (Opoix).
Madame Paul Descombes *Dauthieri* and *Lawrenceanum* (Opoix).
Madame Roen Jolibois Syn. *œnanthum.*
Madame Van Houtte .. Syn. *Tautzianum.*
Mdlle. Jose Descombes *œnanthum* and *Argus* (Opoix).
Mdlle. Louise Sceller de Gisors Syn. *Pitcherianum.*
Mdlle. Madeline Gayot *Dayanum* and *insigne Chantinii* (Jolibois).
Mdlle. Nancy Descombes *Argus* and *niveum* (Opoix).
Madeline *bellatulum* and *Argus.*
Madiolianum *villosum* and *Chamberlainianum* (Cappi).
Madouxianum..... *œnanthum* and *Boxallii atratum* (Madoux).
Magnet..... *insigne Chantinii* and *Boxallii.*
magnificum..... *Pollettianum* and *insigne giganteum* (Keeling).
Mahleræ *Rothschildianum* and *Lawrenceanum* (R. H. Measures).
Malyanum *Spicerianum* and *Crossii* (Sander).
Mansellii..... *Chamberlainianum* and *villosum* (Charlesworth).
Manto *Chamberlainianum* and *Harrisianum.*
Marchioness of Salisbury..... Syn. *Charles Rickman.*
Marguerite Mantin.... *Crossianum* and *barbatum Warnerii* (Mantin).
Maria Syn. *Chamber-Leeanum.*
Marjorie *Leeanum superbum* and *insigne* (Wigan).
marmarophyllum *Hookeræ* and *barbatum* (Veitch).
Marriottianum *Spicerianum* and *niveum* (Marriott).
Marshallianum *venustum pardinum* and *concolor* (Veitch).
Marshallianum luteum *concolor* and *venustum* (Graves).
Marshianum *Lawrenceanum* and *œnanthum superbum* (Sander).
Marwoodii *niveum* and *Harrisianum.*
Mary Beatrice..... *Gowerianum* and *bellatulum* (Schofield).
Mary Lee..... *Leeanum* and *Arthurianum* (Lee).
Masereelianum Syn. *Leeanum.*
Masoni..... Syn. *Alice.*
Masonianum *villosum* and *Harrisianum superbum* (Sander).
Massaianum *superciliare* and *Rothschildianum* (Sander).
Maudiæ *Lawrenceanum Hyeanum* and *callosum Sanderæ* (Charlesworth).
Maurelianum *Dauthieri* and *Spicerianum* (Black).
Mauriceanum Syn. *Pitcherianum.*

Cypripedium.

Maynardii *purpuratum* and *Spicerianum* (Sander).
Measuresiæ *superbiens* and *bellatulum* (Sander).
Measuresianum *villosum* and *venustum* (Williams).
Medea Syn. *Ceres*.
medium *Druryi* and *Sallieri* (Hye).
Meirax *venustum* and *barbatum* (Williams).

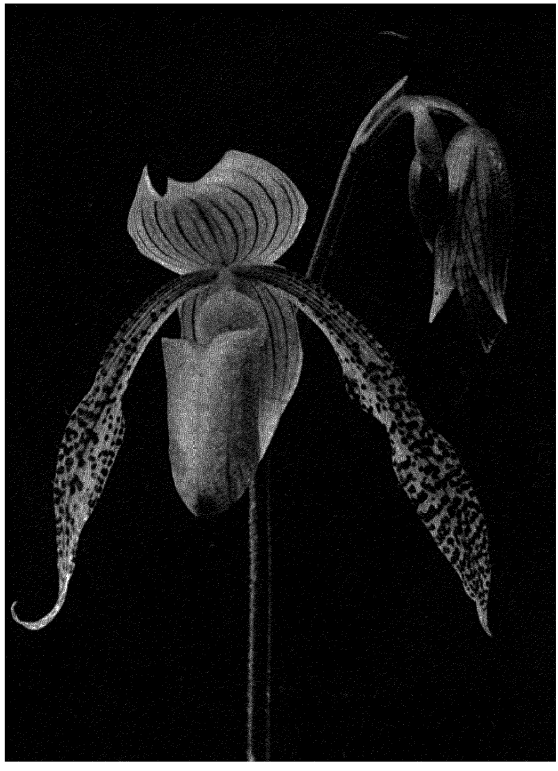
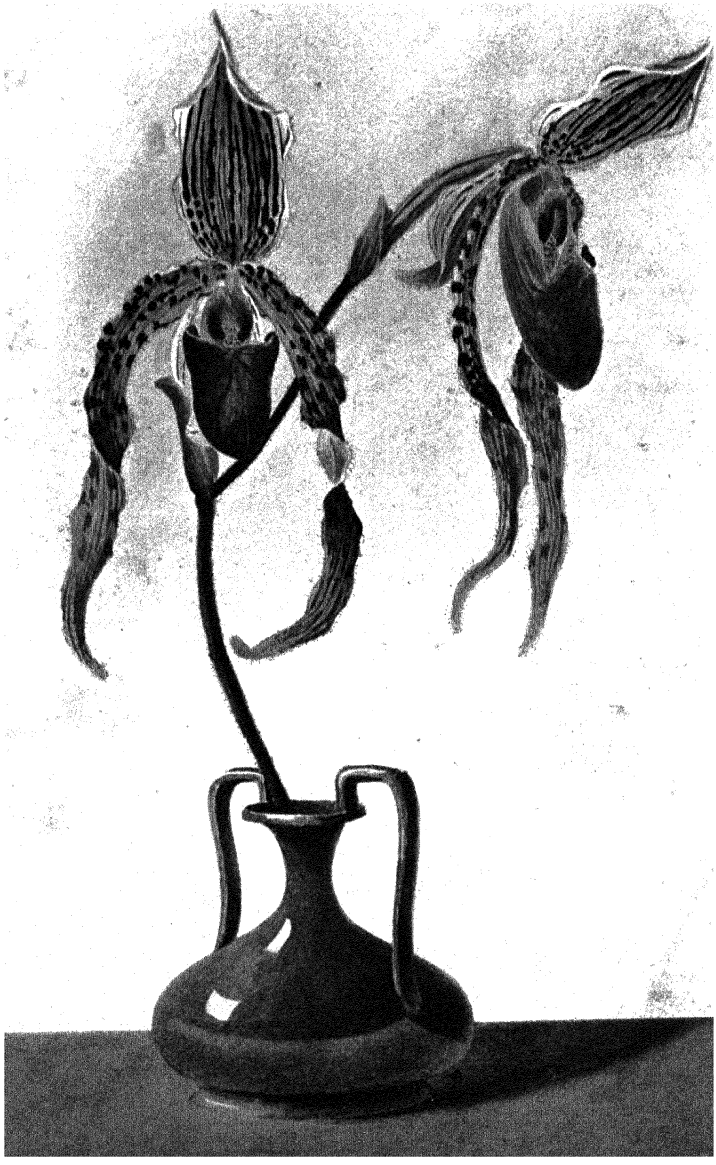


FIG. 58. FLOWER OF CYPRIPEDIUM MORGANIÆ
(much reduced).

Melanophthalmum *barbatum* and *venustum* (Williams).
melanthum *Hookeræ* and *Stonei* (Veitch).
Meleona Syn. *Madame Jules Hye*.
Memoria Moensii *Spicerianum* and unknown, probably *hirsutissimum* (Moens).
Merops *Druryi* and *ciliolare* (Veitch).
Meteore Syn. *Charles Rickman*.



CYPRIPEDIUM MISS FANNY WILSON.

Cypripedium.

Metis *philippinense* and *barbatum* (Veitch).
microchilum *niveum* and *Druryi* (Veitch).
Millmani *philippinense* and *callosum* (Hollington).
Milo *insigne Chantinii* and *œnanthum superbum* (Veitch).
Minerva *elegans* and *venustum* (R. H. Measures).
miniatum *Curtisii* and *insigne* (Sander).
Ministre A. Vigar *barbatum purpureum* and *superciliare* (Mantin).
Minnie *Leeanum* and *nitens* (Wellesley).
Minnie Ames *Curtisii* and *concolor* (Sander).
Minos *Spicerianum* and *Arthurianum* (Veitch).
Minos *Leeanum* and *insigne* (Statter).
Mira *Harrisianum* and *Hookeræ* (Vuylsteke).
Miss Fanny Wilson .. *Sanderianum* and *Argus* (Drewett).
Miss Louisa Fowler .. *insigne Chantinii* and *Chamberlainianum* (Fowler).
Miss Minnie Ames.... Syn. *Minnie Ames*.
Miss Rehder..... *Argus* and *hirsutissimum* (Rehder).
modestum *Harrisianum* and *tonsum* (Graves).
Mœnsii..... *callosum* and *Spicerianum* (Quincey).
molestum *purpuratum* and *Io* (Sander).
Monsea..... Syn. *Euryandrum*.
Mons. de Curte *Boxallii* and *insigne Chantinii* (Vervaet).
Mons. Finet *callosum superbum* and *Godefroyæ* (Reignier).
Monsitteanum *superbiens* and *callosum* (Mantin).
Moreanum *superciliare* and *callosum* (Reignier).
Morganiæ (Fig. 58) .. *superbiens* and *Stonei* (Veitch).
Morganiæ Langleyense *superbiens* and *Stonei platytænium* (Veitch).
Mrs. Alfred Fowler .. *Charlesworthii* and *Lathamianum* (Fowler).
Mrs. Caroline Allen .. *œnanthum superbum* and *callosum* (McArthur).
Mrs. Charles Canham *superbiens* and *villosum* (Veitch).
Mrs. C. Maynard *nitens* and *Boxallii* (Sander).
Mrs. C. Warren Hook *Dauthieri* and *œnanthum superbum* (Pitcher).
Mrs. D. Solomon *Lathamianum* and *Spicerianum* (Sander).
Mrs. Edgar Cohen.... Syn. *calloso-niveum*.
Mrs. E. G. Uihlein .. Syn. *Leander*.
Mrs. E. V. Low *niveum* and unknown (Low).
Mrs. F. Hardy *superbiens* and *bellatulum* (Sander).
Mrs. F. L. Ames..... *tonsum* and *Fairieanum* (Ames).
Mrs. G. Bollerall *Lathamianum* and *Savageanum superbum* (McMeeking).
Mrs. G. D. Owen *superciliare* and *villosum* (Sander).
Mrs. H. Druce Syn. *Godefroyæ*.
Mrs. Harry Veitch.... Syn. *Antigone*.
Mrs. Leeman Syn. *I'Ansoni*.
Mrs. Mostyn *Calypso* and *Boxallii* (Wellesley).
Mrs. Plummer Syn. *Mrs. C. Maynard*.
Mrs. Reginald Young *Lowii* and *Sanderianum* (Low).
Mrs. Rehder *Argus* and *Rothschildianum* (Rehder).
Mrs. Tautz *insigne Chantinii* and unknown (Tautz).
Mrs. W. Clark *Ashburtoniæ expansum* and *Stonei* (Clark).
multicolor..... Syn. *Hornianum*.
mulus *Harrisianum* and *Lawrenceanum* (Sander).
Muriel Hollington *niveum* and *insigne* (Hollington).
Murillo Syn. *Cyris*.
Nandi *callosum* and *Tautzianum* (R. I. Measures).
Nansen..... *selligerum majus* and *Morganiæ* (Cookson).

Cypripedium.

nanum *Leeanum giganteum* and *Lathamianum* (R. H. Measures).
Neptune *Io grande* and *Rothschildianum* (Sander).
Niobe *Spicerianum* and *Fairieanum* (Veitch).
nitens *villosum* and *insigne* (Veitch).
nitens Leeanum *nitens* and *Leeanum* (Sander).
niveo-ciliolare *niveum* and *ciliolare* (R. H. Measures).
niveo-Druryi *niveum* and *Druryi* (Sander).
niveo-Lowii *niveum* and *Lowii* (Drewett).
nobilior *Haynaldianum* and *Lathamianum*.
Norma *Niobe* and *Spicerianum* (Veitch).
Norrisianum *purpuratum* and *Leeanum* (Rehder).
Northumbrian *calophyllum* and *insigne Maulei* (Drewett).
Numa *Stonei* and *Lawrenceanum* (Veitch).
Oakes Ames *Rothschildianum* and *ciliolare* (Sander).
obscurum Syn. *Ashburtoniæ*.
Odette *vernixium* and *Spicerianum* (Moens).
ænanthum *Harrisianum* and *insigne Maulei* (Veitch).
Œnone *Hookeræ* and *superbiens* (Veitch).
Œno-Spicerianum *ænanthum* and *Spicerianum* (R. I. Measures).
Œno-superbiens *ænanthum* and *superbiens* (Lawrence).
Olenus *bellatulum* and *ciliolare* (R. I. Measures).
Olga Bagshaw *ænanthum superbum* and *callosum* (Le Doux).
Olivet *barbatum gracile* and *Swanianum* (Mantin).
Olivitense *barbatum* and *Warnerii* (Mantin).
Olivia *tonsum* and *niveum* (Ames).
Orestes Syn. *ænanthum*.
Orion *concolor* and *insigne* (Veitch).
Orion *selligerum majus* and *Rothschildianum* (Sander).
ornatum *Harrisianum* and *villosum* (Hye).
orphanum *barbatum* and *Druryi* (Veitch).
Orpheus *venustum* and *callosum* (Sander).
Osbornei Syn. *Pitcherianum*.
Pageanum *superbiens* and *Hookeræ* (Seeger).
Pallas *callosum* and *calophyllum* (Drewett).
Pallens *Spicerianum* and *Dayanum* (Pitcher).
Pandora *Argus* and *Dayanum* (Jolly).
Paris *bellatulum* and *Stonei* (R. H. Measures).
Parishii-Lowii *Parishii* and *Lowii* (Linden).
Parksianum *Boxallii atratum* and *nitens* (Parker).
Parksianum *Spicerianum* and *marmarophyllum* (Pollett).
patens Syn. *marmarophyllum*.
Patersonii *Lowii* and *Dayanum* (Lewis).
Paulii *selligerum* and *Harrisianum* (Bowering).
Pavonianum *Boxallii* and *venustum* (Pitcher).
Peetersianum Syn. *selligerum*.
Pegasus *Leeanum* and *Morganiæ* (R. I. Measures).
Pelias *Haynaldianum* and *insigne Chantinii* (Pitcher).
pellucidum *insigne Maulei* and *Dayanum* (Pitcher).
pendulum *Argus* and *philippinense* (Heath).
Pheres Syn. *Alcides*.
Phœbe *philippinense* and *bellatulum* (Statter).
Picardianum Syn. *Maynardii*.
picturatum Syn. *Hornianum*.
Pitcherianum *Harrisianum* and *Spicerianum* (Sander).
placidum *Ashburtoniæ* and *insigne* (Bale).

Cypripedium.

platycolor..... *concolor* and *Stonei platytænium* (Lawrence).
Plato..... *Boxallii* and *calophyllum* (Low).
pleistochlorum..... *barbatum* and *javanicum virens* (Drewett).
plumosum *barbatum* and *ænanthum superbum* (Statter).
plunerum..... *Harrisianum* and *venustum* (Williams).
politum..... *barbatum* and *venustum* (Williams).
Pollettianum *calophyllum* and *ænanthum superbum* (Sander).
polychromum *politum* and *superbiens* (Clark).

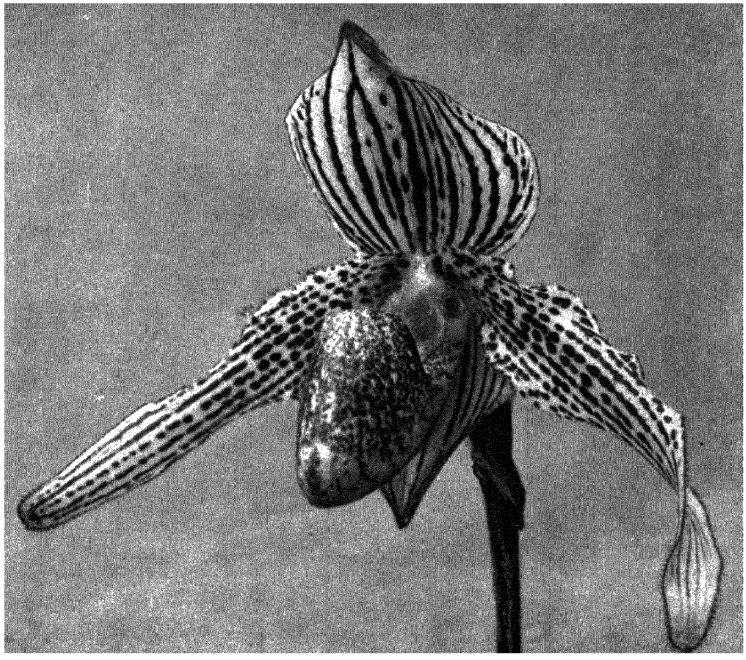


FIG. 59. FLOWER OF CYPRIPEDIUM ROLFEÆ
(nat size).

polystigmaticum *venustum* and *Spicerianum* (R. H. Measures).
Polythemis *venustum* and *tonsum* (Graves).
porphyrochlamys *barbatum* and *hirsutissimum* (Veitch).
porphyrospilum *venustum* and *Lowii* (Veitch).
Poyntzianum *callosum* and *Hookeræ* (nat. hyb.).
Prætus..... *Boxallii* and *Haynaldianum* (Graves).
Prefect Boigner *insigne* and *Uihleinianum* (Mantin).
Premier *beechense* and *Rothschildianum* (Sander).
Prewettii *Harrisianum* and *villosum* (Hollington).

Cypripedium.

Priapus *philippinense* and *villosum*.
Prince Edward of York *Rothschildianum* and *Sanderianum* (Gratrix).
Princess May *callosum* and *Sanderianum* (Sander).
Prism *Niobe* and *insigne Chantinii* (Veitch).
Prospero Syn. *Leeanum*.
Pryorianum..... *Lathamianum* and *Harrisianum* (Sander).
pulcherrimum..... Syn. *œnanthum*.
purpurato-barbato *purpuratum* and *barbatum* (R. I. Measures).
purpurato-Curtisii.... *purpuratum* and *Curtisii*.
pycnopterum *venustum* and *Lowii* (Veitch
Pygmalion *villosum* and *ciliare* (Graves).
quies..... *Hookeræ* and *Curtisii* (R. I. Measures).
radiosum *Lawrenceanum* and *Spicerianum* (Veitch).
Ranjitsinjhii *Boxallii* and *œnanthum superbum*.
Rappartii..... *Charlesworthii* and *Lathamianum* (Rappart).
Raymond Farault *Sedeni* and *caricinum* (Farault).
Refulgence *Curtisii* and *hirsutissimum* (Ingram).
Regale *insigne Maulei* and *purpuratum* (Bull).
Regina..... *Leeanum* and *Fairieanum* (Veitch).
Regnaldianum *insigne* and *callosum*.
Rehderianum *Savageanum superbum* and *purpuratum* (Rehder).
Rene Jolibois Syn. *œnanthum*.
Reynaldii..... *villosum* and *Boxallii*.
Rhemba *barbatum superbum* and *Godefroyæ* (R. I. Measures).
Rimus *Bullenianum* and *purpuratum*.
Robertii Syn. *Alcides*.
Robinianum *Lowii* and *Parishii* (Linden).
Robinsonianum *Lawrenceanum* and *superbiens* (Sander).
Rodigasianum..... Syn. *Maynardii*.
Roeblingianum *Io* and *Boxallii* (Sander).
Rolfeæ (Fig. 59) *bellatulum* and *Rothschildianum* (Statter).
Romulus *insigne Chantinii* and *nitens* (Hye).
Rossianum *barbatum* and *tonsum* (Ross).
Rothschildiano-Boxallii *Rothschildianum* and *Boxallii* (R. I. Measures).
Rothschildiano-tonsum. *Rothschildianum* and *tonsum*.
Rothschildiano-villosum *Rothschildianum* and *villosum* (Veitch).
Rothwellianum *Argus* and *Stonei* (Sander).
rotundum..... *Lathamianum* and *purpuratum* (Keeling).
Rowalliana *villosum* and *venustum* (Fraser).
Roweana *Chamberlainiana* and *bellatulum* (R. H. Measures).
rubens Syn. *bingleyense*.
rubescens *œnanthum superbum* and *Boxallii* (Statter).
rubrum..... *venustum* and *Hookeræ* (Lewis).
Ruth Ayling *niveum* and *Argus* (Hollington).
Said Lloyd *venustum* and *Godefroyæ* (Sander).
St. Hilda..... *Boxallii* and *Curtisii* (Marwood).
St. Mark *villosum* and *Leeanum* (Palmer).
Salis..... *concolor* and *Dayanum* (R. I. Measures).
Sallieri..... *villosum* and *insigne* (Sallier).
Samuel Gratrix *bellatulum* and *Godefroyæ* (Gratrix).
Sanderiano-Curtisii .. *Sanderianum* and *Curtisii* (Cookson).
Sanderiano-selligerum. *Sanderianum* and *selligerum* (Lawrence).
Sanderiano-superbiens.. *Sanderianum* and *superbiens* (Cookson).

Cypripedium.

Sappho *Lowii* and *barbatum* (Veitch).
Saron *niveum* and *venustum Measuresianum* (R. I. Measures).
Saturn Syn. *Leander*.
Savageanum *Harrisianum* and *Spicerianum* (Seeger).
Schlesingerianum *Boxallii* and *insigne Maulei* (Seeger).
Schofieldianum *bellatulum* and *hirsutissimum* (Schofield).
Schusterianum *Hookeræ* and *villosum* (Linden).
Scylla *Dayanum* and *Boxallii* (Graves).
Seegerianum *Spicerianum* and *Harrisianum* (Seeger).
selligero-barbatum *selligerum* and *barbatum* (Joicy).
selligero-Harrisianum.. *selligerum* and *Harrisianum* (Van Imschoot).
selligero - Rothschildianum *selligerum* and *Rothschildianum* (Sander).
selligerum *barbatum* and *philippinense* (Veitch).
sementa..... Syn. *javanico-superbiens*.
Senateur Montefiore .. *marmarophyllum* and *Spicerianum* (Peeters).
Shillianum *Gowerianum* and *Rothschildianum* (Schofield).
Shipwayæ..... *Dayanum* and *Hookeræ* (nat. hyb.).
siamense *callosum* and *Bullenianum var. Appletonianum* (nat. hyb.).
sibyrolense *Boxallii* and *insigne* (Cahazic).
Siebertianum *Dayanum* and *insigne*.
Siemonii *superbiens* and unknown.
Simoni *Leeanum* and *insigne Chantinii*.
Singtonianum *vexillarium* and *barbatum Warnerii* (Sander).
Siraniacum *Dayanum* and *barbatum*.
Sirans *Godefroyæ* and *barbatum Crossii* (Veitch).
Sir G. White *Leeanum giganteum* and *concolor* (Schofield).
Sirius Syn. *Ceres*.
Sir R. Buller *Smithii* and *insigne Chantinii* (Appleton).
Sir T. Lipton Syn. *Olenus*.
Smeeanum *Argus* and *Lathamianum* (Smee).
Smithii..... *Lawrenceanum* and *ciliolare* (Hollington).
Smithii Pretisa Syn. *De Witt Smith*.
southgatense..... *Harrisianum* and *bellatulum* (Lewis).
Souvenir de Madame Jules Dupre Syn. *Pitcherianum*.
Souvenir de Roch Jolibois *Lowii* and *Curtisii* (Opdix).
Sphinx Syn. *Cyris*.
Spicero-Harrisii Syn. *Pitcherianum*.
Spicero-hirsutissimum Syn. *Ceres*.
Spicero-Lowii Syn. *De Witt Smith*.
Spicero-niveum *Spicerianum* and *niveum* (Sander).
Spicero-tonsum Syn. *Madame Jules Hye*.
Statterianum *Spicerianum* and *vexillarium superbum* (Charlesworth).
Stella *Schlimii* and *bellatulum (Lindleyanum)* (Sander).
striatum *niveum* and *philippinense* (Ingram).
suffusum *Lowii* and *Hookeræ* (Barton).
superciliare *superbiens* and *barbatum* (Veitch).
Surprise *Sallieri Hyeanum* and *Spicerianum* (Hye).
Svend Brunn *Lowii* and *Curtisii* (Sander).
Swanianum..... *Dayanum* and *barbatum* (Swan).
Swinburne *insigne Maulei* and *Argus* (Heath).

Cypripedium.

Sylvia Syn. *Goweriana.*
Symondsiæ *venustum* and *purpuratum* (Ross).
tacita..... *Measuresiana* and *tonsum.*
Talisman *Sallieri Hyeanum* and *Harrisianum superbum* (Hye).
Tautzianum..... *barbatum* and *niveum* (Veitch).
Tautzianum lepidum .. *barbatum Warnerii* and *niveum* (Bull).
T. B. Haywood *Druryi* and *superbiens* (Veitch).
Telemachus *Lawrenceanum* and *niveum* (Veitch).
tenebrosum *Harrisianum nigrum* and *Boxallii atratum.*
Tennyson..... *ænanthum superbum* and *Dayanum* (McArthur).
tessellatum *concolor* and *barbatum* (Veitch).
tessellatum porphyreum *concolor* and *barbatum* (Veitch).
Thayerianum *Lawrenceanum* and *Boxallii atratum* (Sander).
The Duke..... Syn. *Euryandrum.*
The Gem *marmarophyllum* and *insigne Chantinii* (Ingram).
The Hendre..... *barbatum Crossii* and *Lawrenceanum.*
Themis *insigne Maulei* and *Harrisianum superbum* (Veitch).
Theodore Bullier *tonsum* and *villosum.*
The Pard..... *superbiens* and *niveum* (Lawrence).
Thetis Syn. *Fitchianum.*
Thibautianum..... *Harrisianum* and *insigne Maulei* (Veitch).
Thoorsianum *hirsutissimum* and *superbiens* (Moens).
Thora *politum* and *insigne Chantinii* (Veitch).
Thorntonii *superbiens* and *insigne* (Mason).
Thyadis *superbiens* and *Chamberlainianum* (R. I. Measures).
Titanis *Harrisianum* and *callosum* (R. H. Measures).
Tityus *ænanthum superbum* and *Spicerianum* (Veitch).
tonso-venustum *tonsum* and *venustum* (Pitcher).
tonso-villosum *tonsum* and *villosum* (Pitcher).
triangularis..... *philippinense* and *venustum* (Sander).
triumphans *ænanthum superbum* and *Sallieri Hyeanum* (Hye).
Troilus *insigne Sanderæ* and *Sallieri Hyeanum* (Fowler).
Troyanowskianum *insigne Chantinii* and *Io grande* (Sander).
Tryonianum *Harrisianum* and *superbiens* (Tate).
turpe..... *barbatum* and *Argus* (Veitch).
T. W. Bond *Lawrenceanum* and *hirsutissimum* (Ingram).
Uihleinianum Syn. *Allanianum.*
Umlaufianum *Lawrenceanum* and *insigne Chantinii* (Sander).
Unixia *Harrisianum superbum* and *Lawre-bel* (R. I. Measures).
Urial..... *Leeanum* and *javanicum* (Graves).
Vallerandii Syn. *Leeanum.*
Vanderielianum Syn. *Calypso.*
Van Houtteanum *niveum* and *Dauthieri* (Van Houtte).
Van Imschootianum .. *callosum* and *insigne Chantinii* (Van Imschoot).
Van Molianum *callosum* and *hirsutissimum* (Linden).
Vanneræ *selligerum majus* and *Curtisii* (Vanner).
Vannerii *Calypso Oakwood var.* and *Chamberlainianum* (Vanner).
Vanninii *Io grande* and *Lawrenceanum.*
Variety..... *Spicerianum* and *ciliolare* (Marwood).
variopictum Syn. *radiosum.*
Veitchi-Dauthieri *superbiens* and *Dauthieri* (Opoix).
Veitchi-Morganiæ *superbiens* and *Morganiæ* (Schofield).
Venus *niveum* and *insigne Sanderæ.*
Venus Oakwood var. .. *insigne Sanderæ* and *niveum* (Cookson).

Cypripedium.

venustum - *Crossianum* *venustum* and *Crossianum*.
vernixiodes *Boxallii* and *javanicum* (Graves).
vernixium *Argus* and *villosum* (Veitch).
Vervæti..... Syn. *Leeanum*.

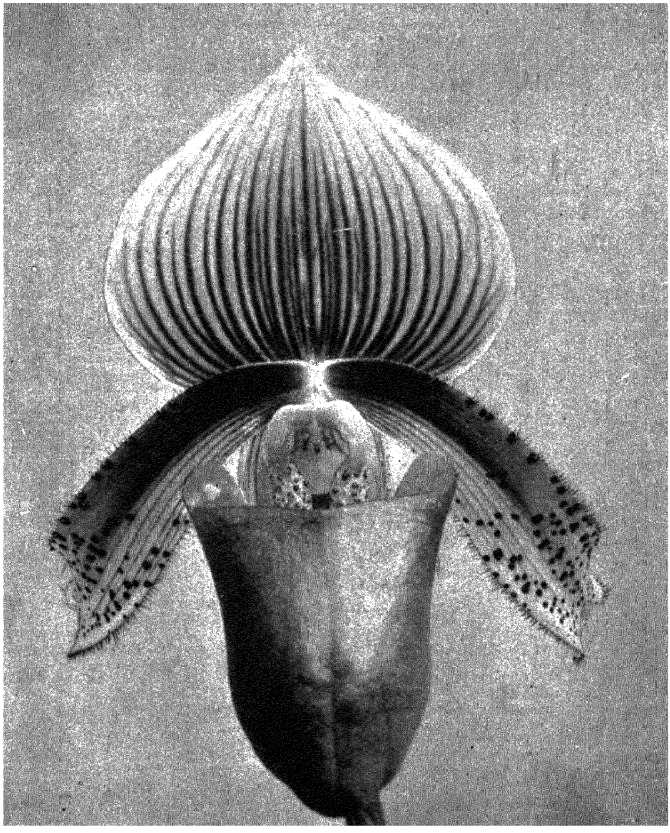


FIG. 60. FLOWER OF CYPRIPEDIUM ZEUS
(nat. size).

Vervætianum Syn. *Euryale*.
Vesta..... *Spicerianum* and *plunerum* (Sander).
Vesta..... *vernixium* and *Harrisianum* (Veitch).
vexillario-bellatulum .. *bellatulum* and *vexillarium* (Briggs-Bury).
vexill-Io *Io* and *vexillarium* (Cookson).

Cypripedium.

vexillarium	*barbatum* and *Fairieanum* (Veitch).
Vibilia	*insigne* and *javanico-superbiens* (Graves).
Vidor	*Charles Canham* and *Harrisianum superbum* (R. I. Measures).
villoso-œnanthum	*villosum* and *œnanthum* (Ashworth).
villoso-Harrisianum	*villosum* and *Harrisianum*.
violaceum	Syn. *Germinyanum*.
Vipani	*philippinense* and *niveum* (Vipan).
W. A. Allen	Syn. *Wallertianum*.
Wallertianum	*Harrisianum* and *villosum* (Peeters).
Warnero-superbiens	*barbatum Warnerii* and *superbiens* (Graves).
warnhamense	Syn. *Clinkaberryanum*.
Warocqueanum	Syn. *vexillarium*.
Watsonianum	*Harrisianum nigrum* and *concolor* (Sander).
Weathersianum	*Leeanum superbum* and *hirsutissimum* (Linden).
Wendlandianum	*vernixium* and *Harrisianum* (Sander).
Wendlandianum	*œnanthum* and *venustum* (Charlesworth).
westonense	*Appletonianum* and *barbatum Warnerii* (Appleton).
Whitelyanum	*Boxallii atratum* and *Lawrenceanum* (Shaw).
W. H. Young	*barbatum* and *Curtisii* (Wigan).
Wiertzianum	*Rothschildianum* and *Lawrenceanum* (Linden).
Wiganæ	*Dayanum* and *barbatum Warnerii* (Wigan).
Wiganianum	*Hookeræ* and *Ashburtoniæ* (Wigan).
William Lloyd	*bellatulum* and *Swanianum* (Hollington).
William Trilease	*Rothschildianum* and *Parishii* (Sander).
Williamsianum	*villosum* and *Harrisianum* (Williams).
Wincqzianum	*Harrisianum superbum* and *Haynaldianum* (Linden).
Winifred Hollington	*ciliolare* and *niveum* (Hollington).
Winnianum	*villosum* and *Druryi* (Veitch).
Woden	*superbiens* and *Leeanum* (R. I. Measures).
Woodfordiense	*Beechense* and *Charlesworthii* (Gurney Fowler).
woodlandense	*Dayanum* and *virens* (Sander).
Wottonii	*callosum* and *bellatulum* (R. I. Measures).
W. R. Lee	*superbiens* and *Rothschildianum* (Lee).
xanthophyllum	*Hookeræ* and *Mastersianum* (R. H. Measures).
Y'mir	*Hookeræ* and *Rothschildianum* (R. I. Measures).
Youngiæ	*bellatulum* and *Hookeræ volonteanum* (Young).
Youngianum	*superbiens* and *philippinense* (Sander).
Zalmoxis	*Williamsii* and *vexillarium*.
Zampa	*Leeanum superbum* and *hirsutissimum* (Vuylsteke).
Zeno	*insigne Chantinii* and *nitens* (Veitch).
Zephyr	Syn. *Eyermanianum*.
Zeus (Fig. 60)	*callosum* and *ciliolare* (R. I. Measures).
Zuriago	*œnanthum superbum* and *Chamberlainianum* (Leeman).

CYRTOCHILUM (*H.B.K.*). *See* **Oncidium.**

CYRTOPERA.

Lindley's name for a genus embracing a few species of warm, intermediate-house Orchids, of the tribe *Vandeæ*,

Cyrtopera.

mostly natives of Asia and Africa, and nearly allied to *Cyrtopodium*. From the latter genus they differ in the lateral sepals being wider at the base, and connate with the foot of the column, and in the single inflorescence. The name is from *kyrtos*, curved, and *pera*, a sac; in reference to the sac-like appendage of the lip. Flowers generally showy, in erect spikes, springing from the base. Leaves long, thin, plaited, dark green. Stems short or elongated. The species require similar culture to *Cyrtopodium*, but they are rarely cultivated outside botanic gardens. *C. plantaginea* is an interesting species, with leaves like a *Calanthe*, and a long raceme of numerous long-bracted flowers, with light green sepals, short, green, white-bordered petals, and a white lip with bluish-green, brown-streaked side lobes.

CYRTOPODIUM.

Upwards of a score of showy-flowered terrestrial Orchids, of the tribe *Vandeæ*, are included in the genus *Cyrtopodium* (*R. Br.*), a name derived from *kyrtos*, curved, and *pous*, a foot; in reference to the shape of the lip. Sepals free spreading, sub-equal, or the lateral ones broader at the base, and more or less decurrent into the foot of the column; petals similar to the dorsal sepal, but rather broader and shorter; lip affixed to the base of the column, the chin more or less prominent, the lateral lobes rather broad, the middle one rounding, entire, two-lobed, or crisped-toothed. Leaves long. Pseudo-bulbs sometimes 5ft. high.

Where plenty of space is available, the species are well worth growing. Ample pot-room is essential to their successful culture. They should be provided with good drainage and a compost consisting of fibrous loam, peat, and sphagnum, to which has been added a liberal sprinkling of rough sand or broken crocks. During the growing season the plants require a warm, humid temperature, with a liberal supply of water at the roots; while in a dormant state they should be placed in a cooler house, with only sufficient moisture to retain them in a plump condition. *C. Andersoni* and *C. punctatum* are the best species, and those most frequently met with in cultivation.

Cyrtopodium.

C. Andersoni (*R. Br.*).—Flowers bright yellow, produced in spring upon a branching scape, sometimes 3ft. high; lip brighter than the sepals, front lobe slightly concave. Leaves long, lanceolate, sheathing at base. West Indies, 1804. (B. M., t. 1800.)

C. punctatum (*Lindl.*).—Apart from its showy flowers this species, like the one just named, is well worth growing on account of its fine, long curved leaves. It flowers in spring, the wavy sepals and petals being yellowish, spotted with brown, and the three-lobed lip clear yellow. The large bracts are greenish-yellow, with purple spots. (B. M., t. 3507.)

CYSTORCHIS.

A small genus of stove, terrestrial Malayan Orchids, of the tribe *Neottieæ*. They are of little horticultural value, and rarely seen in cultivation outside botanic gardens. Blume's name is from *kystos*, a bladder, and *orchis*.

DENDROBIUM.

This genus of the tribe *Epidendreæ*, founded by Swartz, has supplied a larger number of beautiful garden Orchids than any other among those which are natives of the Old World. Between 300 and 400 species are known, about 100 of which are cultivated in English collections, and amongst these are many Orchids that, for beauty of flowers, are unsurpassed in the whole Vegetable Kingdom. Size, habit, form of stem and leaf, shape and colour of flowers, all show considerable diversity. The generic name at once proclaims that they are epiphytes—from *dendron*, a tree, and *bios*, life.

The pseudo-bulbs of Dendrobiums exhibit a wonderful range of form—from a small, thin, wiry stem to a strong, woody pseudo-bulb as tall as a man, and as thick as one's wrist. Species with the habit and appearance of Epidendrums, Cattleyas, Cœlogynes, &c., are known. The Bamboo-like stem is most frequent among those in cultivation, others being club-shaped or ovate; they are always marked with ring-like scars, called joints, and they are either pendulous or erect. The foliage is strap-shaped or ovate, or sometimes very narrow and grass-

Dendrobium.

like, and it is either deciduous or persistent till the pseudo-bulbs perish. The flowers are borne in lateral or terminal bunches, sometimes singly, sometimes in very large, pendent racemes; the sepals and petals are usually equal in length, the two lateral sepals being joined at the base, and forming a spur, or chin; the lip is usually large and handsome, and is narrowed to a stalk-like base; the column is attached by its middle to the ovary, and there are four waxy pollinia.

The natural distribution of *Dendrobium* extends over an immense area, from the Himalayas, through Burma, to the Malayan regions, Australia, New Zealand, China, and Japan. None have been found in Africa or in Madagascar. They are most abundant in Burma and Moulmein, and from these two places the majority of the most beautiful of cultivated kinds have been obtained. As having an important bearing on the cultural requirements of Dendrobiums, a few observations on the climate of these regions may be worth attention. The wettest months are from June to September, at which time the atmosphere is almost constantly saturated. As much as 600in. of rain have been known to fall in these regions in one year, and 250in. in a month have been recorded (Hooker). The average day temperature at this season is from 80deg. to 90deg. in the shade, falling to about 70deg. at night. From October to February little or no rain falls, and the atmosphere is, therefore, very dry; the temperature also is lower. This is the resting season for vegetation, the Dendrobiums at this time being dried almost to scorching, and shrivelled to half their size. In the Malayan and Philippine regions, the climate is almost equal all the year round. The air is nearly always saturated, and the average temperature in the shade is 90deg. by day, seldom falling below 75deg. at night. During the wettest months there is sunshine for several hours almost every day, and in the driest season there are occasional showers. From these facts we obtain some data which will enable us to regulate the treatment for Dendrobiums so as to accord, in a measure, with the conditions under which they are found in a state of Nature.

Culture.—All the species grow upon trees or rocks in positions exposed to sunshine, so that under cultivation

Dendrobium.

they require very little shading. For the tropical species the temperatures most suitable are as follow:

Months.	Night.	Day.
	deg.	deg.
November to February	55	60
February to April	60-65	70-80 (with sun)
May to August	65-70	75-95 ,,
September and October	60-65	70-80 ,,

Although the above temperatures apply generally, the real test is the condition of the plants, of which the cultivator must make careful note.

During the growing season the atmosphere should be kept saturated by frequently damping the paths, stages, &c.; and as soon as the normal temperature has been reached, and the outside conditions are favourable, the plants should be thoroughly saturated with the syringe, as frequently as may be necessary to maintain a thorough moistness in the atmosphere. Care should be observed to see that the foliage is allowed to become dry before the cooler evening temperature arrives. The house should be closed early in the afternoon, making as much use as possible of the sun-heat. It will be beneficial to the plants if a high temperature is maintained during the afternoon. Every encouragement should be given to induce the plants to mature their growth during our short summer. They require a long rest after they reach maturity.

The plants, after reaching maturity, should not be taken direct from their growing quarters and placed in a dry, airy position, but they should be gradually removed, thereby avoiding any possibility of check in transit. During the resting season only sufficient water will be required to keep the pseudo-bulbs in a normal state until the flower-buds make their appearance, when the plants should be again accorded warmer conditions and be more liberally dealt with. These remarks apply to the deciduous section. The Evergreen, and members of the New Guinea and Australian sections, are best rested in the house in

which they have been grown. They will not stand too great a drought.

The plants should be re-potted as soon as the new growth begins to push after the flowering season is passed. Pots, pans, baskets, rafts, and blocks are used, the first two for such strong sorts as *D. chrysanthum*, *D. chrysotoxum*, *D. fimbriatum*, *D. speciosum*, &c.; baskets are preferred for the smaller and more delicate kinds, and rafts and blocks for those which do not like to have their roots confined. Grand specimens have been grown on blocks with a little sphagnum about the roots; but to do this the plants must be kept in a constantly-saturated atmosphere and a high growing temperature. Those that thrive in pots or pans should be planted in a compost of good fibrous peat and sphagnum, with a little sand or crock-dust, to keep the mixture porous. Dendrobiums resent too much material about them, and the receptacles should therefore be kept well drained, and as small as possible. Two-thirds of the pot should be occupied with clean drainage, and the mixture should be pressed in firmly about the roots. In every case, when re-potting is done, the plants should be made to stand firmly in the pots by means of stakes, as those which are loose in the soil do not get established nearly so quickly as those which are firm.

When the plants are grown in baskets they should be supplied with ample drainage, and the compost consist almost entirely of chopped sphagnum and sand.

Aphides sometimes attack the young growths of Dendrobiums, and thrips are frequently found on both young and old foliage. There is also the Dendrobium Beetle to be reckoned with. For the method of dealing with these pests the reader is referred to the Introductory remarks.

Propagation.—Almost the whole of the deciduous section of Dendrobiums are easy to propagate, either by division of the pseudo-bulbs or by cutting off the back bulbs, selecting those that have not flowered over-freely. They should be laid on a damp bed of moss in a stove or in a close propagating-case, when they will quickly form new growths; these, as soon as the new roots make their appearance, should be cut off with a

Dendrobium.

portion of the old wood and potted up in chopped sphagnum and rough sand. Or the pseudo-bulbs may be cut in lengths containing three nodes, and inserted in a pan of sphagnum as cuttings. These should

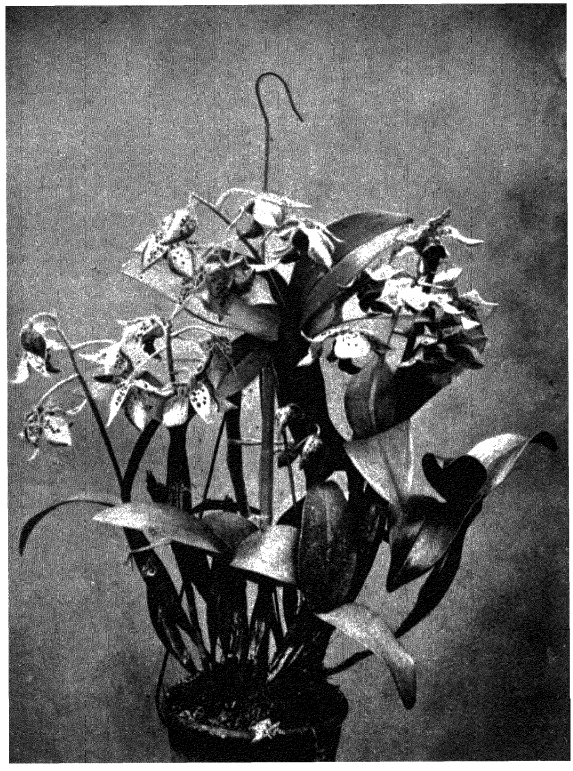


FIG. 61. DENDROBIUM ATROVIOLACEUM
(much reduced).

be stood in a hot, humid atmosphere, where they quickly start, and may be potted up singly when new roots appear. Every encouragement in the way of heat and moisture will be necessary until growth is complete.

Dendrobium.

D. aggregatum (*Roxb.*).—A dwarf-growing species, not exceeding 3in. or 4in. in height. The pseudo-bulbs, each of which bears a solitary leaf, are crowded, angular, 2in. long, and deep green. The flowers are clear yellow, becoming deeper with age, the lip being dark yellow in front; they are borne in arching racemes about 6in. long. This species blossoms during March, April, and May. It is a native of Northern India and Southern China, and first flowered in England in 1834. (B. M., t. 3643.) The best variety is that known as *majus*.

D. albosanguineum (*Lindl.*).—This short, sturdy species has stems ½in. in diameter, and less than 1ft. high. Leaves lance-shaped, 6in. long. The flowers, which grow two or three on a scape, appear in May; they are very large (about 4in. across), and of a soft creamy-white; the petals, which are twice as broad as the sepals, have a few blood-red streaks at the base; and the labellum has two large blotches of reddish-crimson in the middle. During the growing season this plant requires stove heat and a thoroughly moist atmosphere. It is a native of the open hill forests of Moulmein. (B. M., t. 5130.)

D. amœnum (*Wall.*).—A slender-growing plant. Pseudo-bulbs about 1ft. long, with short internodes. Leaves narrow, 3in. long, deciduous. Flowers 2in. across, produced singly (sometimes two or three together) on the upper part of the ripened leafless growths; sepals and petals equal, white, tipped with amethyst; lip broad, notched at the margin, hairy in the throat, coloured amethyst, with a white edge and a yellow blotch in front. It blossoms in May, and is remarkable for its delicious violet-like odour. It requires the same treatment as *D. nobile*. Himalaya, 1874. (B. M., t. 6199.)

D. atroviolaceum (*Rolfe*).—Allied to *D. macrophyllum*, this delightful species was discovered by the late David Burk when travelling as a collector for Messrs. J. Veitch and Sons, in New Guinea, in 1890. Sepals and petals creamy-white, spotted with deep purple; lip violet-purple inside, green outside, three-lobed; spike terminal, erect. Pseudo-bulbs tapering downwards, persistent, with two or three stout leathery leaves near the apex. (Fig. 61; B. M., t. 7371; G. C., 1894, xv., p. 113, fig. 12.)

D. aureum (*Lindl.*).—An easily-managed, very charming Dendrobe. The pseudo-bulbs are from 1ft. to 1½ft. high, smooth, plump, as thick as the thumb in the upper half, yellowish when old; leaves lance-shaped, 4in. long, deciduous. Flowers in twos or threes from the nodes of the two-year-old stems, each one 2in. across; sepals and petals nearly equal, cream colour; lip large, channelled, reflexed, velvety above, buff-yellow, streaked

with dull red; column orange-red. The flowers are developed in January or February, and remain fresh about a fortnight; they change to a deep golden-yellow before perishing; they are also remarkable for their strong primrose fragrance. The species thrives best when planted in baskets. Native of various parts of India; introduced in 1837. Syn. *D. heterocarpum.* (Fig. 62; B. M., t. 4708.)

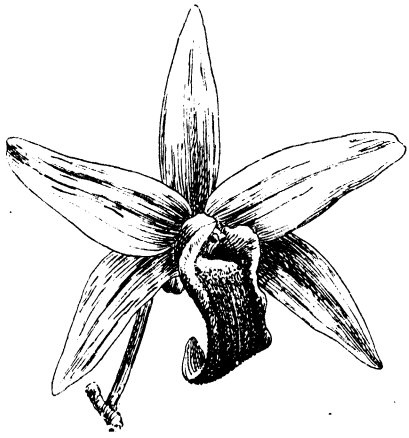


FIG. 62. FLOWER OF DENDROBIUM AUREUM

(⅔ nat. size).

Var. *Henshalli.*— Pseudo-bulbs longer. Lip white, with a yellow blotch and two reddish spots. (B. M., t. 4970, as *D. heterocarpum Henshalli.*)

Var. *philippinense.*— Pseudo-bulbs almost pendent, from 3ft. to 5ft. long. Flowers paler, and the segments more acute, than in the type.

D. Bensoniæ (*Rchb. f.*).— A handsome species, erect in habit, the pseudo-bulbs from 1ft. to 2ft. high, terete, yellowish when mature. Leaves about 2in. long, deciduous. Its lovely flowers, which are about 2½in. across, are produced in May and June, growing in twos or threes on the upper part of the stem; the sepals and petals are milk-white; the lip is white, with an orange centre, and ornamented near the base with two large velvety-black blotches. This species is a native of Moulmein, whence it was introduced to our gardens in 1866, by Lieut.-Col. Benson. It is not easily kept in health after about two years' cultivation. It should be planted in a pot or a basket, in peat-fibre and sphagnum, and be grown in a hot-house; when growth is finished, the plants should be placed in an intermediate temperature, and be kept dry. (B. M., t. 5679.)

D. bigibbum (*Lindl.*).—This sturdy species has fusiform pseudo-bulbs, 1ft. to 2ft. high, and bears about half-a-dozen lance-shaped leaves 4in. long. Flower-spikes from near the apex of the two-year-old pseudo-bulbs, erect, about 1ft. long, bearing from four to twelve or more flowers, each of which is 1½in. across, full; the sepals are oblong; the petals broader than long, magenta-purple; the lip is funnel-shaped, with a

tongue-like front lobe, deep maroon, with a raised white crest. The spur is two-lobed or double-chinned, whence the specific name. The blossoms appear late in the autumn. Tropical Australia, 1824. (B. M., t. 4898.)

D. Brymerianum (*Rchb. f.*).—One of the most remarkable of all Orchids. Pseudo-bulbs erect, as thick as a pencil, slightly swollen in the middle, 1ft. or more long, yellowish. Leaves lance-shaped, 4in. long, persistent. Flowers in racemes from the top of the pseudo-bulbs, one to three in each raceme; sepals and petals equal, 1in. long, spreading; lip sometimes 3in. long by 1½in. broad, the greater part of it cut up into long, branching, interlacing filaments, forming a deep fringe to the central part, which is heart-shaped and downy on the surface. The whole flower is a beautiful golden-yellow colour. Burma, 1874. For its cultivation, the plant requires the same treatment as recommended for *D. aureum*. It blossoms in February or March. (Fig. 63; B. M., t. 6383.)

Var. *histrionicum* has much shorter pseudo-bulbs, smaller flowers, and little or no fringe.

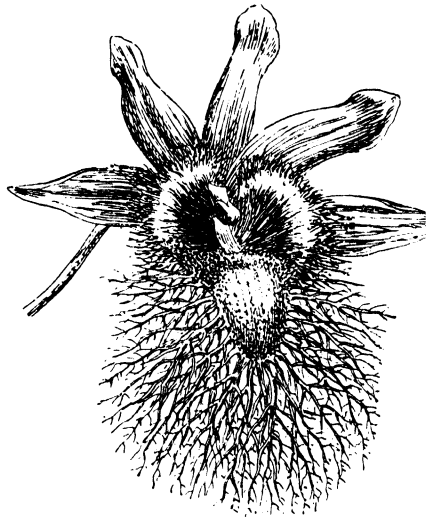


FIG. 63. FLOWER OF DENDROBIUM BRYMERIANUM (nat. size).

D. cambridgeanum (*Paxt.*).— A synonym of *D. ochreatum*.

D. canaliculatum (*R. Br.*).—A pretty greenhouse species of easy culture. Flowers sweet-scented, disposed on a stem about 1ft. long; sepals and petals white and yellow; lip white, with a mauve disk. North East Australia, 1865. (B. M., t. 5537.)

D. cariniferum (*Rchb. f.*).—Flowers white, in bunches of four or more, from one year and older bulbs; sepals tinged with yellow at the tips; labellum orange, tipped with white and furnished with a cinnabar-red crest. Pseudo-bulbs erect, evergreen, 1ft. long. Burma, 1869.

D. chrysanthum (*Wall.*).—A large-growing kind, the pseudo-bulbs often attaining a length of 5ft. or 6ft., semi-erect, somewhat

twisted, as thick as the little finger. Leaves lance-shaped, 4in. long, deciduous. Flowers on the young leafy pseudo-bulbs, in axillary racemes, usually four to six flowers on each; these are 1½in. across, waxy in texture, full, bright orange-yellow; the lip is rounded and fringed. It blossoms in the autumn. Upper Burma, 1828. Syn. *D. Paxtoni.* (B. R., t. 1299.)

D. chrysotis (*Rchb. f.*).—A synonym of *D. Hookerianum.*

D. chrysotoxum (*Lindl.*).—A richly-coloured and first-rate species. Pseudo-bulbs club-shaped or spindle-shaped, furrowed, 6in. to 12in. long, bearing four apical leaves, each about 4in. in length, leathery. Racemes produced from near the top of the last-ripened pseudo-bulbs, each raceme 8in. long, arching, and many-flowered; flowers 2in. across, spreading; sepals and petals nearly equal, rich golden-yellow; lip the same colour, deeper in front, and streaked with red in the throat; margin fringed, the upper surface pubescent. The blossoms are developed in March and April. Burma, 1847. (B. M., t. 5053.)

Var. *suavissimum* has stouter pseudo-bulbs and broader leaves than the type; the flowers, too, which appear in June, have a large maroon blotch on the lip, and are sweet-scented.

D. Cœlogyne (*Rchb. f.*).—Flowers very large; sepals and petals yellowish, mottled with red; sepals 2½in. long, acuminate; petals narrower; lip deep dull purple, the side lobes narrow, the mid-lobe trapezoid-ovate. Leaves broadly elliptic-oblong, notched, 3in. to 6in. long, very coriaceous. Pseudo-bulbs very stout, 1½in. to 2in. long. Moulmein, 1894.

D. crassinode (*Rchb. f.*).—Structurally a beautiful and interesting species. It has pendulous pseudo-bulbs, from 1ft. to 2ft. long, formed throughout of swollen internodes in the form of depressed spheres, 1in. in diameter, and less than that apart. Leaves narrow, 4in. long, deciduous. Flowers in twos and threes from the upper nodes of the last-ripened pseudo-bulbs, each one 2½in. across; sepals and petals equal, oblong, pointed, white, with a blotch of amethyst at the tip; lip spreading, kidney-shaped, 1in. across, slightly fringed, hairy on the upper surface, yellow, zoned with white, amethyst at the apex. It blossoms from January to March, lasting several weeks in beauty. Moulmein, 1868. (B. M., t. 5766.)

Var. *Barberianum* has flowers with much more purple colour in them than in the type.

D. crepidatum (*Lindl.*).—A pretty and free-flowering plant, with pseudo-bulbs 1ft. long, ½in. in diameter, striped with white.

Dendrobium.

Leaves narrow, 3in. long, deciduous. Flowers from the nodes of the youngest-ripened pseudo-bulbs, usually in pairs or threes, on purple stalks, waxy, 1½in. across, white, with tints of lilac; lip heart-shaped, pursed, and blotched with yellow in the throat. Assam, 1849. (B. M., t. 4993.)

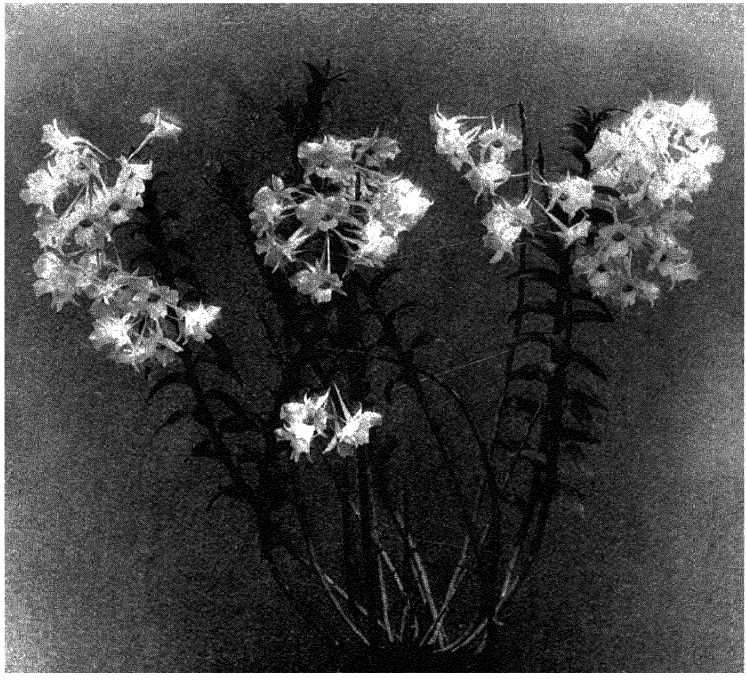


FIG. 64. DENDROBIUM DEAREI
(much reduced).

D. crystallinum (*Rchb. f.*).—A graceful and pretty species, very free-flowering, and easy to manage. The pseudo-bulbs are tufted, about 1ft. long, as thick as a goose-quill, striated. Leaves narrow, 4in. long, deciduous. Flowers in pairs or threes from the nodes of the last-ripened pseudo-bulbs, each flower 1½in. across, delicate in texture, white, tipped with amethyst; lip rounded, yellow, with a white border and a blotch of amethyst

in front. Native of Burma; introduced in 1867. A well-grown specimen of this is exceedingly beautiful. (B. M., t. 6319.)

D. cymbidioides (*Blume*).—Flowers of medium size, showy; sepals and petals ochreous-yellow, linear-oblong, spreading; lip white, blotched with purple near the base, much shorter than the sepals and petals, oblong-cordate, three-lobed, bearing on the disk tubercles arranged in two or three lines or series, the side lobes short, incurved, the terminal lobe ovate, obtuse; peduncles terminal, erect, loosely racemose, five- to seven-flowered. Pseudo-bulbs ovate or oblong-ovate, angled, bearing at the summit two linear-lanceolate, coriaceous leaves, 6in. long. Salak, Java, 1852. (B. M., t. 4755; G. C., 1896, xix., p. 581, fig. 90.)

D. Dalhousieanum (*Paxt.*).—A synonym of *D. pulchellum.*

D. Dearei (*Rchb. f.*).—A stout, erect-growing plant, the stems 2ft. to 3ft. long, the upper part leafy. Leaves 2in. long. Flower-spikes from the top of the pseudo-bulbs, five to seven flowers in each; sepals narrow; petals oval; lip oblong. The whole flower measures nearly 2½in. across; colour white, with a pale yellowish-green blotch in the throat. This free-flowering, handsome species was introduced from the Philippines in 1882, and has already become a popular Orchid. It requires a position in the hottest house whilst growing, and it must have an abundance of moisture during the active period. It thrives best when planted in baskets. The blossoms are developed in July or August, and last three months in perfection. (Fig. 64; W. O. A., t. 20.)

D. densiflorum (*Wall.*).—An erect-growing, evergreen species, and a very distinct plant. Its pseudo-bulbs are somewhat club-shaped, four-angled, and about 1ft. in height, furnished near the apex with several broad, oblong, shining leaves, about 4in. in length. The flowers are 2in. across, of a rich orange-yellow, and are produced in numerous long, dense, pendulous racemes, which last about a week in perfection. The lip is of a deeper hue than the other portions of the flower, and is densely covered with soft, downy hairs. (Fig. 65; B. M., t. 3418.)

Var. *Schrœderi.*—This has longer and looser racemes, with larger flowers; the sepals and petals are French white, the lip is deep orange. It is sometimes called *densiflorum album.*

D. Devonianum (*Paxt.*).—This has been called the "King of Dendrobiums"; and it is so beautiful and elegant that its right to such a name can scarcely be disputed. It is of a pendulous habit; the stems are 3ft. or more long, and slender, bearing blossoms for about half their length. The leaves are

Dendrobium.

narrow, 3in. long, deciduous, falling away before the blossoms are produced, usually in May or June. The flowers are 2in. across; the sepals and petals are soft creamy-white, tinged with pink, the latter being tipped with bright purple; the lip is heart-shaped, white, margined with purple, with a rich orange blotch at the base, and bordered all round with a delicate lace-like frilling. The species is named in compliment to the sixth Duke of Devonshire, in whose gardens at Chatsworth it was first flowered in 1837. It was introduced from the Khasia Hills. (B. M., t, 4429.)



FIG. 65. DENDROBIUM DENSIFLORUM
(much reduced).

D. Draconis (*Rchb. f.*)—A white-flowered, handsome species, with erect pseudo-bulbs about 1ft. high, and as thick as the little finger, rounded, covered with short, black hairs. Leaves lance-shaped, 3in. long, remaining on for two years. Flowers in compact heads from the uppermost joints, each 2in. across; sepals and petals lance-shaped and pointed, pure white; lip tongue-shaped in front, crisp-edged, three ridges in the throat, white, with orange-red stripes at the base. Flowering season, May and June. This is a free-flowering plant, the blossoms lasting a long time. Burma and Siam, 1862. Syn. *D. eburneum*. (B. M., t. 5459.)

Dendrobium.

D. eburneum (*Rchb. f.*).—A synonym of *D. Draconis.*

D. Falconeri (*Hook.*).—One of the most beautiful of all Dendrobiums. Pseudo-bulbs thin and quill-like, or short and knotted, branching freely, and covered with grass-like leaves 3in. long. Flowers produced singly from the nodes of the last ripened growths, each about 3in. across, full; sepals oblong, white, with a rosy tinge; petals broader, white, tipped with amethyst; lip large, spreading in front, funnelled behind, and coloured rich maroon, with an orange blotch on each side and a zone of white in front, the tip being rich amethyst. It blossoms in May and June, the flowers lasting about a fortnight. This popular Orchid is easily procured, being imported in large quantities annually. It thrives best when grown on blocks or in shallow baskets; or a piece of soft fern stem may be used as a block. It should be grown in a cool intermediate-house temperature. Assam, Bhotan, 1856. (B. M., t. 4944.)

D. Farmeri (*Paxt.*)—A compact, evergreen, upright-growing plant, with pseudo-bulbs from 1ft. to 1½ft. high, narrow at the base, thickened above, four-angled, and bearing several shining dark green leaves 6in. long towards the top. The flowers are produced in spring, on long, pendulous racemes, in the same manner as those of *D. densiflorum*, but not so closely set together—they are 2in. across; the sepals and petals are pale straw-colour, delicately tinged with pink, the disk of the lip being golden-yellow, and the upper surface downy. It is a very beautiful and delicate species, and lasts some ten or twelve days in perfection. Moulmein and Khasia, 1847. (B. M., t. 4659.)

Var. *albiflorum* has white sepals and petals, and a yellow lip.

Var. *aureum* is distinguished from the type by its bright yellow sepals and petals, and golden lip. (B. M., t. 5451.)

D. fimbriatum (*Hook.*).—The pseudo-bulbs are 2ft. to 5ft. long, stout and woody, the upper half furnished, when young, with green leaves about 6in. long. The racemes are pendulous from the top of the ripened stems, each bearing from six to twelve blossoms; the flowers are from 2in. to 3in. across, of a thin and delicate texture throughout, and deep rich orange in colour, the margin of the rounded lip being beautifully bordered with a golden moss-like fringe. It blossoms during the months of March and April, the same stems producing flowers for several seasons in succession. Northern India, 1822. (P. M. of B., ii., 172.)

Var. *oculatum* differs from the type in having the flowers blotched in the centre with deep maroon-purple. Syn. *D. Paxtoni.* (B. M., t. 4160.)

Dendrobium.

D. Findlayanum (*Rchb. f.*).—A very distinct plant, its pseudo-bulbs being shining yellow, 1½ft. long, flexuous, knotted at the nodes, the internodes narrow. Leaves lance-shaped, 3in. long, deciduous. Flowers on the last-ripened leafless pseudo-bulbs, near the top, usually in pairs, on longish stalks; sepals and petals overlapping, of a soft lavender colour; lip spreading, heart-shaped, yellow, margined with white. The flowers measure from 2in. to 3in. across, and are produced in spring. Burma, 1877. It is frequently imported in large quantities. (B. M., t. 6438.)



FIG. 66.—FLOWER OF DENDROBIUM FORMOSUM (much reduced).

D. formosum (*Roxb.*).—The largest-flowered among the white kinds. It has stout, erect pseudo-bulbs 1ft. to 2ft. high, hairy when young, and covered with broad-ovate leaves, which are 5in. long, and somewhat leathery. Flowers on the end of the leafy stems, usually in bunches of three or five; each flower is at least 4in. across, full, and of the purest white, save for a blotch of yellow in the throat; the sepals are lance-shaped and pointed; the petals are almost as broad as long, blunt; the lip is scoop-shaped, with a large, tongue-like reflexed front. The blossoms appear in autumn and last several weeks in perfection. In most cases newly-imported plants grow and flower perfectly; but in about three years they generally commence to deteriorate

and gradually to decline. This is particularly the case when the plant is grown in an ordinary collection of Orchids. The exception to the rule is where the plants can be grown in a forcing fruit-house such as that set apart in gardens for the culture of Figs. Here excessive atmospheric moisture is maintained during the hottest parts of the year. When *D. formosum* is in an active state, and suspended near the glass where no shade has been provided, it thrives admirably, and appears to retain its native vigour for an indefinite period. Mr. J. Hudson (Mr. Leopold de Rothschild's gardener at Gunnersbury House) is most successful with this species under the above system. It is a native of British Burma, where it is found only in the plains low down, growing upon trees, from which it obtains only partial shade. From February to April the plants are exposed to a temperature of 110deg. in the shade, and consequently they get a thorough ripening. In the Andaman Islands, where it is also a native, it gets practically no rest, rain falling for about eleven months in the year. It prefers basket treatment to pots. Introduced in 1837. (Fig. 66; B. R. 1839, t. 64.)

D. Freemani (*Hort.*).—A synonym of *D. lituiflorum Freemani.*

D. Fytchianum (*Batem.*).—A small-flowered Orchid, with erect, slender pseudo-bulbs, 1ft. or more in height, bearing lance-shaped deciduous leaves, 4in. long. Flowers in terminal racemes of eight or more, each flower 1½in. across, with narrow sepals, broad petals, and a heart-shaped lip, at the base of which is a tuft of silky hairs. Colour of whole flower pure white, with a tinge of lilac in the throat. It blossoms in April or May. This graceful species should be planted in a small teak basket, suspended near the roof-glass. Moulmein, 1863. (B. M., t. 5444, erroneously as *D. barbatulum.*)

D. glomeratum (*Rolfe*).—A distinct and quaint species, allied to *D. cumulatum*, but having larger flowers. Flowers disposed in short, dense, axillary racemes, with large imbricating bracts; sepals and petals bright rose; lip orange. Stems 2½ft. long. Moluccas, 1894. (G. C., 1894, xv., p. 653, fig. 80.)

D. Griffithianum (*Lindl.*).—Closely related to *D. densiflorum.* Pseudo-bulbs erect, four-angled above, narrowed to a quill-like stalk below, 1ft. or so long, and bearing at the top two or more leathery leaves about 2in. wide and 5in. long. Flowers in terminal pendulous racemes, the latter 1ft. or more long, each flower 2in. across, bright yellow; the lip orange-yellow, and fringed at the margin. It blossoms in May or June, and requires the same treatment as *D. densiflorum.* Burma, 1877.

Dendrobium.

Var. *Guibertianum* has longer racemes and larger and brighter-coloured flowers.

D. Harveyanum (*Rchb. f.*).—Flowers deep chrome-yellow, with two orange blotches on the lip; chin short, emarginate; sepals triangular-lanceolate, acute; petals oblong, acute, fringed; lip round, a little involved at the base, with strong fringes, a rough surface, and an obscure callus at base; peduncle lateral, filiform, four-flowered. Pseudo-bulbs fusiform, 6in. long. Burma, 1883. (G. C., 1894, xvi., p. 593, fig. 76.)

D. heterocarpum (*Lindl.*).—A synonym of *D. aureum.*

D. Hildebrandii (*Rolfe*).—This species varies somewhat in colour on the disk of the labellum. Flowers 3in. across; sepals and petals pale dull yellow, twisted; lip orange, short, roundish; racemes numerous, axillary. Leaves 5in. long, 1½in. wide. Stems 2ft. long. Burma, 1894. (B. M., t. 7453.)

D. Hillii (*Hook.*).—A synonym of *D. speciosum Hillii.*

D. Hookerianum (*Lindl.*).—A noble species, related to *D. fimbriatum.* Its tall, rod-like pseudo-bulbs are 5ft. or more high, with swollen bases, and clothed, when young, with lance-shaped leaves 5in. long. The flowers are in axillary racemes, produced near the top of the stems, each raceme bearing from six to twelve flowers, which are at least 3in. across, full; the sepals and petals are equal, rich golden-yellow; the lip is broad and spreading, fringed at the margin, and velvety on the upper surface, yellow, with two blotches of deep maroon in the throat. It requires the same treatment as *D. pulchellum,* and produces its flowers in autumn. Sikkim and Assam, 1868. Syn. *D. chrysotis.* (B. M., t. 6013.)

D. infundibulum (*Lindl.*).—An erect-growing species, with stems about 1½ft. high, ¼in. thick, round, bearing black hairs about the nodes. Leaves 3in. long. Flowers on the top of the last year's growth, usually in threes; they are large, often 4in. across, and pure ivory-white, except the lip, which is serrated, and stained with yellow or deep orange-red; they appear during March, April, and May, and last a very long time. The bases of the two lateral sepals are prolonged into a tapering funnel-shaped spur, about 1in. long, from which the plant takes its specific name. For its cultivation this species requires to be grown in a cool, moist house, such as Odontoglossums generally thrive in. A liberal supply of water is required when growing, and the plant should be kept just moist at the root when at rest; but it does not like much watering overhead. This species is a native of the mountains

of Moulmein, at an elevation of about 5000ft. (B. M., t. 5446.)

Var. *Jamesianum.* — This has stouter pseudo-bulbs, and a differently formed lip, the front of which is cinnabar-coloured. This is accorded specific rank by some botanists.

D. Jamesianum (*Rchb. f.*).—A variety of *D. infundibulum Jamesianum.*

D. japonicum (*Lindl.*).—A synonym of *D. moniliforme* (of *Swartz*).

D. Jenkinsii (*Wall.*).—A dwarf species, with short, ovoid, compressed pseudo-bulbs crowded into a mass, each bearing an ovate leaf 1in. long; the whole plant scarcely attains more than 2in. in height. The flowers appear in early spring, and are mostly in pairs on thin, drooping peduncles; they are large, and bright orange-yellow in colour, darker in the throat. A native of Northern India, and thriving in a stove, but it requires ripening in a sunny, dry house for about two months in winter. (B. R., 1839, t., 37.)

D. Johnsonæ (*F. Muell.*).—Flowers 4in. to 5in. across; sepals and petals white, the former lanceolate, the latter longer and broader, sub-rhomboidal, acuminate; lip nearly as long as the petals, three-lobed, the side lobes white, with a large purple spot at the anterior margin, the middle lobe white, purple at base, as is the ligulate, furrowed callus; column white, bordered purple; racemes ascending, nine to twelve or more flowered. Leaves oblong, sub-acute, leathery, 3in. to 4in. or more in length. Stems erect, sub-cylindric, 5in. to 8in. high, usually two- or three-leaved. New Guinea, 1882.

D. Linawianum (*Rchb. f.*).—In habit of growth this species resembles *D. nobile*, yet is sufficiently distinct from that species to be easily recognised, even when not in flower. It is an erect-growing, evergreen, winter-flowering plant. The stems are about 1ft. long, compressed, showing the distinct angles. Leaves 3in. long. Flowers 2in. across, and produced freely in pairs; they are nearly white in the centre, the rest of the sepals and petals being pale rosy-lilac or cerise; the lip is small, white, with two purple blotches in front, wholly purple in the throat. It is a native of China and Japan, where it is reported as growing on walls and in hedges. It is not common in cultivation, although introduced as early as 1824. Syn. *D. moniliforme.* (B. M., t. 4153.)

D. lituiflorum (*Lindl.*). — This is a beautiful Orchid, similar to *D. nobile* in habit, &c., but slenderer. The pseudo-bulbs are about 2ft. long, grey, and pendulous. Leaves 3in.

long, narrow, deciduous. Flowers 2in. across, usually in pairs, in shape similar to those of *D. nobile*; sepals and petals amethyst-purple, paler at the base; lip deep maroon, with the front portion white. This plant may be grown in a pot or in a basket, and during the growing season it enjoys a liberal supply of water. Its blossoms are produced in great profusion during the months of April and May. In form they are somewhat remarkable, being curved like a trumpet, with the mouth upwards, whence the name of the species, as the "lituus" of the Romans was a slightly-curved trumpet. It is a native of India. (B. M., t. 6050).

Var. *candidum* has larger flowers, with white sepals and petals, and a yellow lip.

Var. *Freemani* has the lip covered with denser hairy bodies, and with the zone yellowish-white.

D. Lowii (*Lindl.*).—A pretty-flowered species, related to *D. Draconis*. The pseudo-bulbs are 1ft. high, erect, leafy on the upper half, the internodes covered with black hairs. Leaves 3in. long. Flowers in compact racemes, developed near the top of the leafy stems, each flower 1½in. across the mouth, somewhat funnel-shaped, with a distinct, straight spur; petals slightly broader than the sepals; lip tongue-shaped in front, reflexed, pale yellow, with six raised lines of reddish hairs; rest of flower pale buff-yellow. This plant, which was introduced from Borneo in 1861, must be grown in a moist house all the year round, in a shallow teak basket, with a little sphagnum about its roots. It develops its blossoms in autumn. (B. M., t. 5303.)

D. luteolum (*Batem.*).—Flowers primrose-yellow, with a little orange and crimson on the lip, 1in. to 2in. across, produced in threes or fours from the upper part of the last made pseudo-bulbs and branches. Pseudo-bulbs 1ft. to 2½ft. long, ¼in. in diameter. Burma, 1864. (B. M., t. 5441.)

Var. *chlorocentrum* has pale primrose blossoms, with greenish hairs on the disk of the lip.

D. MacCarthiæ (*Hook.*).—One of the very finest of the genus. The stems are 2ft. long, as thick as a goose-quill, erect, grey, purplish at the joints. Leaves narrow, 4in. long. The flowers are large, nearly 3in. in length, and rather more in width; the sepals and petals are very pointed, not so spreading as in *D. nobile*, and coloured rosy-mauve and white; the lip is tongue-shaped, as long as the sepals and petals, pale lavender, striped and blotched with purple, a blotch of deep maroon occupying the middle. The beautiful colouring of this species, and the

fact of its lasting many weeks in perfection, render it a most desirable Orchid. Unfortunately, it is difficult to manage under cultivation, and is therefore somewhat rare. It should be planted in baskets in as little compost as possible, and suspended near the glass in the moist stove. It should be kept growing till mid-winter, and then rested for about two months. This species is peculiar to the forests of Ceylon, where it hangs from the trunks of large trees. (Fig. 67; B. M., t. 4886.)



FIG. 67.—FLOWER OF DENDROBIUM MACCARTHIÆ (½ nat. size).

D. macranthum (*Hook.*).—A synonym of *D. superbum.*

D. macrophyllum (*A. Rich.*).—Flowers greenish-yellow, hairy outside, produced in long, terminal, erect racemes; lip three-lobed, striped and spotted with purple. New Guinea, 1838. (B. M., t. 5649.)

D. macrophyllum (*Lindl.*).—A synonym of *D. superbum.*

D. moniliforme (*Sw.*).—Flowers white, with a few purple spots on the lip, deliciously fragrant; they are borne on the upper part of the previous year's leafless stems, in clusters of two or more from a joint. Pseudo-bulbs thin, about 10in. high, clothed with grass-like leaves. China and Japan, 1824. (B. M., t. 5482, under name of *D. iaponicum.*)

D. moniliforme (*Lindl.*).—A synonym of *D. Linawianum.*

D. nobile (*Lindl.*).—At once one of the oldest, one of the best-known, one of the easiest-grown, one of the cheapest in commerce, and one of the most beautiful species in cultivation. The pseudo-bulbs are from 1ft. to 3ft. in height, jointed, leafy. The leaves are about 4in. long and 1in. broad, and they remain on the stems till two years old. The flowers are from 2in. to 4in. across, full; sepals and petals equal in length, the latter as broad again, white, tinted with amethyst; the lip is funnel-shaped, spreading in front, downy inside and out, maroon-purple in the throat, the front portion white, with a purple tip. The plant is evergreen, and should be grown in a pot or a pan if a large specimen is required; smaller examples may be accommodated in baskets. When growth is complete, remove the plant to

Dendrobium.

a cool house, and give it only just sufficient moisture to keep its pseudo-bulbs from shrivelling. It usually blossoms during spring and early summer. It is a native of China and various

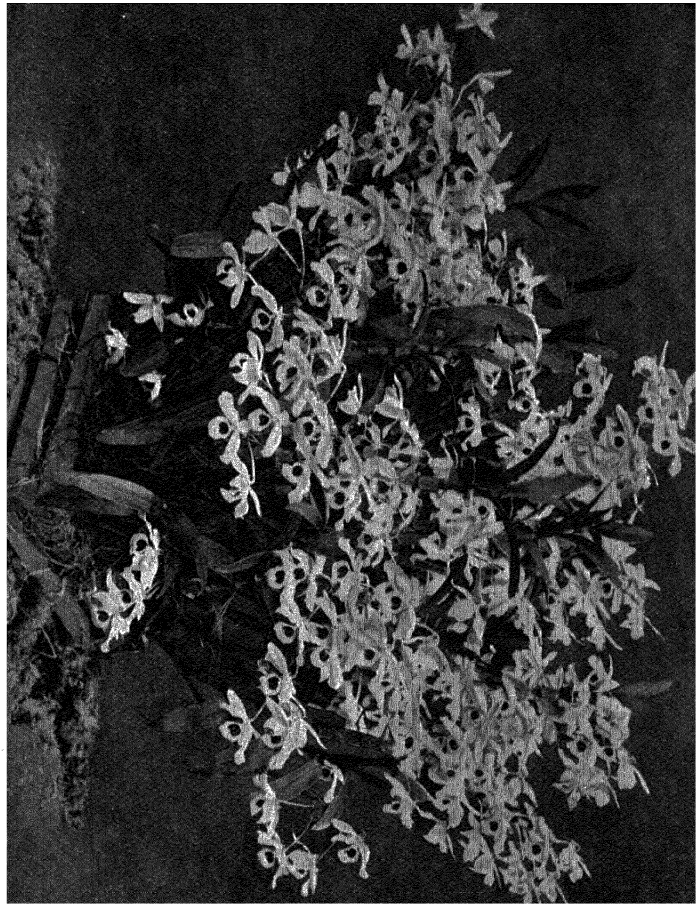


FIG. 68. DENDROBIUM NOBILE (much reduced).

parts of India; the first plant known in cultivation was introduced from Macao by Reeves, in 1836. (Fig. 68.) There are numerous beautiful varieties of this species in cultivation. The best of them are:

Var. *alba.*—Pure white, excepting the primrose disc on the lip.

Dendrobium.

Var. *albans* has white segments, with a dark maroon disk.

Var. *Balliana* has the segments faintly tinted rose; lip salmon-pink.

Var. *burfordiense* has the two lower sepals coloured like the lip.

Var. *cærulescens.*—Smaller in all its parts, the flowers very deeply coloured.

Var. *Cooksonianum.*—This has the two petals coloured like the lip. It is a remarkably beautiful plant.

Var. *nobilius.*—Flowers larger than in any other form. The sepals and petals brilliant amethyst, paler towards the base; lip deep maroon, with a zone of milk-white in front.

Var. *Sanderianum.*—Flowers large, and brilliant in colour.

Var. *Schrœderianum.* — Flowers large; sepals and petals white; lip deep maroon-purple, almost black, yellowish in front.

D. nobile pallidiflorum (*Hook.*).—A synonym of *D. primulinum.*

D. ochreatum (*Lindl.*).—A beautiful plant when well flowered. It has short, thick knotted pseudo-bulbs, which are rarely 1ft. long. Leaves deciduous, lance-shaped, 3in. long, thin and succulent. Flowers on the young pseudo-bulbs at the same time as the leaves, 2½in. across, full; sepals and petals equal; lip almost circular, slightly concave, downy; colour deep golden yellow, with a large blotch of deep maroon on the lip. Khasia Hills, 1837. Syn. *D. Cambridgeanum.* (B. M., t. 4450.)

D. Parishii (*Rchb. f.*).—Distinct and beautiful is this species, named in honour of its discoverer, the Rev. C. P. Parish. When out of flower it is readily distinguished by its thick, fleshy, leafless stems. These are about 1ft. long. The flowers, which are produced freely in May and June, in groups of two or three, are purplish-rose, fading into white towards the centre; the lip, which is shorter than the sepals and petals, is marked inside with rich purple. This species was introduced in 1862. (B. M., t. 5488.)

D. Paxtoni (*Lindl.*).—A synonym of *D. chrysanthum.*

D. Paxtoni (*Paxt.*).—A synonym of *D. fimbriatum oculatum.*

D. Phalænopsis (*Fitzg.*).—This species is of exceptional beauty and variety. Pseudo-bulbs 1ft. to 4ft. in length, thickest in the middle, grey when mature. Leaves lance-shaped, 5in. long, produced on the upper part of the new growth. Flowers on long, slender scapes, which spring from the top of the leafy growths when mature, strong plants producing scapes of twenty

Dendrobium.

or more flowers which are 3in. wide; sepals lance-shaped and pointed; petals as broad again, both coloured rosy-lilac, with darker veins; lip with two arching side lobes and an oblong, pointed front one, the back, with the lateral sepals, forming a

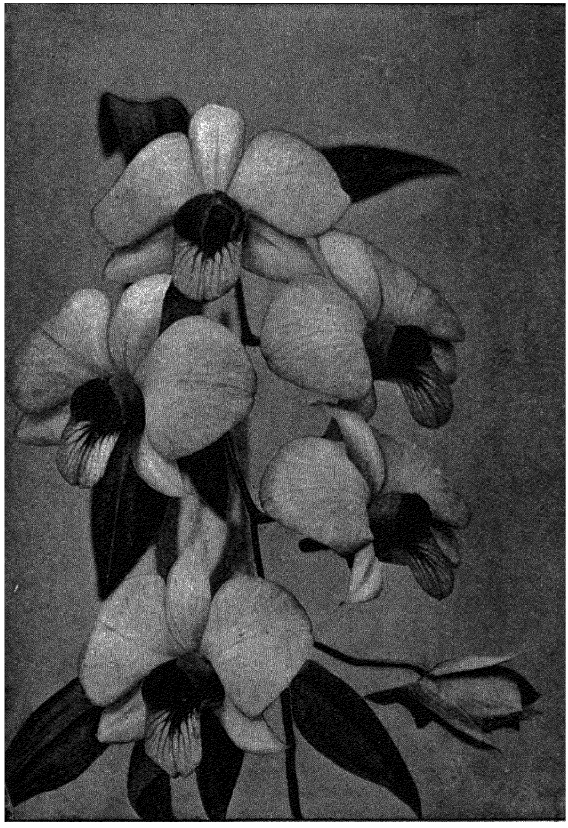


FIG. 69. PORTION OF FLOWER-SCAPE OF DENDROBIUM PHALÆNOPSIS (much reduced).

broad spur; colour deep maroon in the throat, paler and striped on the front lobe. This plant should be grown in a teak basket, in the hottest and moistest stove, from which it should never be removed, but allowed to rest by withholding water.

Dendrobium.

It is now extensively used for decorative purposes, and is a most desirable plant to cultivate away from large towns. A native of New Guinea, &c.; introduced in 1880. (Fig. 69; B. M., t. 6817).

There are several named varieties of this, all from importations of plants from New Guinea, and distributed under the name of *D. Phalænopsis*, var. *Schrœderianam*. These vary in colour from pure white to deep rosy-purple.

D. Pierardi (*Roxb.*).—An old, easily-grown, spring-flowering species, with long, pendulous stems, that often attain to 3ft. and more in length. The leaves are ovate or lance-shaped, 3in. to 5in. long, deciduous, and the upper two-thirds of the long stem is laden with long-lasting flowers, in which the sepals and petals are pale mauve, tinged with rose, the broad, flat labellum being primrose-colour, with a few purple lines near the base, the upper surface downy. It is a common Indian species, growing chiefly upon mango-trees, and was introduced to the Calcutta Botanic Garden by M. Pierard, whose name it bears. With us it thrives when planted in a basket or on a block, and grown along with *D. nobile*. It has been in cultivation since 1815. (B. M., t. 2584.)

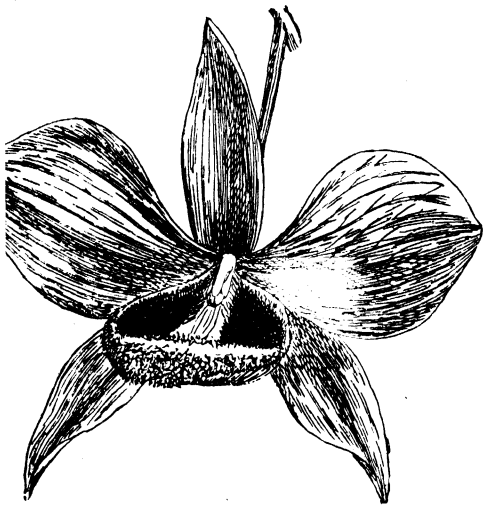


FIG. 70. FLOWER OF DENDROBIUM PULCHELLUM
(⅔ nat. size).

D. primulinum (*Lindl.*).—A charming, easily-grown, and free-flowering species. The pseudo-bulbs are about 1ft. long, drooping, as thick as the little finger, grey-green. Leaves lance-shaped, 4in. long, deciduous. Flowers in pairs from the joints of the last-ripened growths, each 2in. or more across; sepals and petals narrow and equal, pale mauve; lip 2in. across, covered with soft hair as if frosted, coloured pale primrose-yellow, with a tinge

of purple in the throat. (B. M., t. 5003, under name of *D. nobile pallidiflorum.*)

D. pulchellum (*Roxb.*).—This beautiful species is best known in gardens as *D. Dalhousieannm.* The flower-spikes, which are produced near the apex of the pseudo-bulbs bear from three to ten flowers, 3in. to 5in. across; the sepals and petals are pale nankeen-yellow, tinged with rose; the large downy lip is of the same colour, with two large blotches of dark crimson at the base. (Fig. 70.)

D. revolutum (*Lindl.*).—A somewhat remarkable species, bearing solitary axillary flowers, $\frac{3}{4}$in. long; sepals and petals white, reflexed upwards, lanceolate, acute, nearly equal; lip bright yellow-green, nearly quadrate, convex; disk with three furrows and red bands; bracts caducous. Leaves numerous, distichous, 1in. to 2in. long, oblong or linear, or ovate-oblong, obtuse or retuse, half-amplexicaul. Stems tufted, 1ft. long. Malay Peninsula, 1882. (B. M., t. 6706.)

D. secundum (*Wall.*).—Flowers purple, with a yellow lip, small, disposed in short, dense racemes, which are produced from near the top of the two-year-old and older pseudo-bulbs. Pseudo-bulbs 2ft. to 3ft. high, $\frac{1}{2}$in. in diameter, bearing short, broad leaves. Malay, 1829. (B. M., t. 4352.)

D. signatum (*Rchb. f.*).—Allied to *D. Bensoniæ.* Flowers—chin very blunt, angled; sepals sulphur, ligulate, acute, reflexed; petals white to lightest ochre, broader, acute, reflexed; lip shouldered at base, nearly square and narrow, suddenly enlarged; disk marked with a blotch and four lines of brown; column light green, with some mauve lines; one-flowered. Siam, 1884.

D. speciosum (*Sm.*).—In this sturdy species the pseudo-bulbs are very stout, 1ft. or more long, nearly 2in. in diameter at the base, bearing two or three leathery, dark, shining leaves, 8in. to 10in. long, and one-third as wide. It produces a long, terminal, semi-erect raceme (from 1ft. to 2ft. in length) of fragrant, wax-like, creamy or yellowish-white blossoms, which, although not large, are very numerous. They are curiously inverted, the lip appearing to be at the upper part of the flower; the sepals and petals are incurved and narrow; the lip is shorter than the sepals, and is spotted with purple. When this plant is making its young growths, a little heat is necessary; but when these are mature, it should be removed to cooler conditions for two or three months, giving only just sufficient water to prevent shrivelling. It should be grown in a pot. A little leaf-mould may be added to the compost with considerable

advantage. This species has another point of recommendation in the fact that its blossoms appear in the middle of winter. It is a native of Queensland, Victoria, and New South Wales, where it is known as the "Rock Lily," and was introduced as long ago as 1824. (B. M., t. 3074.)

Var. *Hillii.* Stem and leaves longer; racemes more crowded, with flowers which are paler than those of the type. Syn. *D. Hillii.* (B. M., t. 5261.)

D. spectabile (*Miq.*).—In this somewhat remarkable species the flowers are large, singularly formed, and produced in upright spikes; sepals and petals pale yellow, with irregular stripes of purple, the former being triangular, extended into a wavy tail, the latter narrower; lip white, with purple veins, the side lobes erect, hood-like, the front one elongated. New Guinea, 1899. (Fig. 71.)

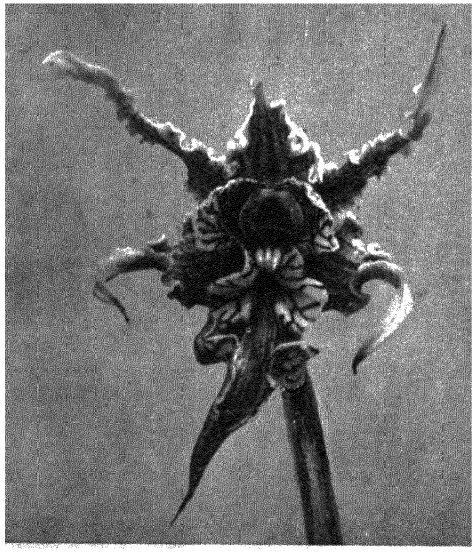


FIG. 71. FLOWER OF DENDROBIUM SPECTABILE (much reduced).

D. superbiens (*Rchb.*). — A handsome plant, related to *D. bigibbum.* It has erect, woody pseudo-bulbs, 1½ft. or more high, as thick as the finger, leafy on the upper half till two years old. Leaves broad, 3in. long. Flowers on long, terminal, slender spikes, each flower 2in. across; petals broader than the sepals, both reflexed, and coloured rosy-purple, with the margins almost white; lip crimson-purple, short, with incurved side lobes, the front lobe oblong, reflexed, and wavy. Tropical Australia, 1876.

D. superbum (*Rchb. f.*).—A magnificent plant, better known under the name of *D. macrophyllum.* The pseudo-bulbs are pendent, from 2ft. to 4ft. long, ½in. in diameter. Leaves 6in. long,

1½in. broad, deciduous. Flowers in pairs from the joints of the ripened new growths, each 4in. across; sepals lance-shaped, petals as broad again, both rich magenta-purple; lip folded at the base, heart-shaped in front, hairy on the upper surface, and coloured crimson-purple, paler at the apex. Odour powerful, like that of rhubarb. Philippines, 1840. Syns. *D. macranthum*, *D. macrophyllum*. (B. M., t. 3970.)

Var. *anosmum*.—Stems shorter. Flowers usually produced singly, and almost odourless.

Var. *Burkei*.—Flowers white, with two light blush rose cheeks on the base of the disk of the yellowish-white lip. 1884. A very scarce and desirable variety.

Var. *Huttoni*.—Stems slender. Flowers white, purple in the throat.

D. thyrsiflorum (*Rchb. f.*).—This plant is almost identical with that already described under the name of *D. densiflorum var. Schrœderi*, the only difference between the two being in the characters of the pseudo-bulbs, those of the former being without angles, from 1½ft. to 2ft. high, and brownish when mature; whilst in the latter they are four-angled, short, and green. The flowers of the two are identical. Both plants are ranked among the most beautiful of all Orchids; they are easily grown, and blossom freely and regularly every spring (about April). Burma, 1864. (B. M., t. 5780.)

D. tortile (*Lindl.*).—A pretty species, not unlike *D. primulinum*. The pseudo-bulbs are club-shaped, 1ft. long, slightly compressed and zigzag, yellowish when old. Leaves lance-shaped, 3in. long. Flowers 3in. across; sepals and petals narrow, twisted, rosy-lilac; lip broad, woolly or "frosted" on the upper surface, and coloured pale primrose-yellow, with a purplish blotch in the throat. Tenasserim, 1847. (B. M., t. 4477.)

D. transparens (*Wall.*).—A beautiful species, with erect, smooth, slender pseudo-bulbs, about 1ft. long, and narrow deciduous leaves 3in. long. Flowers in pairs on the ripened leafless pseudo-bulbs, each 1½in. across; sepals lance-shaped; petals broader, both coloured pale lilac, tipped with rose; lip shaped as in *D. nobile*, white, with two purple blotches in front, and pale purple at the apex. Assam, 1852. (B. M., t. 4663.)

D. Wardianum (*Warn.*).—One of the most useful and beautiful Dendrobiums. The pseudo-bulbs are from 2ft. to 4ft. long, as thick as a man's finger, knotted and pendent. The leaves are lance-shaped, 4in. long, deciduous (falling off before the blossoms appear). The flowers are produced during the months of March and April; they grow in threes on opposite sides of the greater

part of the stem, and measure usually from 3in. to 4in. across. The sepals and petals are broad, thick, and waxy, and blunt at the tips, their ground-colour is white, the upper portion being a bright, rich magenta; the lip is large, white in front, with a blotch of purple on the apex, and rich orange in the throat, with two deep eye-like spots of amethyst-purple. The flowers last a long time in full beauty. This plant is a native of Assam and Burma, and was first flowered in England in 1858. It requires to be grown in a basket, as its stems are long and pendulous. During the growing season it enjoys an abundant supply of water, with a high temperature; when the growths are complete, the plants should be removed to a cooler atmosphere, and be kept dry during the resting period. As soon as the flower-buds become prominent the plants should be removed to warmer quarters, and more liberal treatment be afforded. (B. M., t. 5058.)

From the first, the nomenclature of hybrid Dendrobiums has been in a state of confusion, owing to distinctive names having been given to plants derived from the same parentage. We give a list of names with parentage as recorded :—

GARDEN HYBRIDS.

Adrasta	*Pierardi* and *superbum* (Veitch).
Æneas	*moniliforme (japonicum)* and *crystallinum* (Veitch).
Ainsworthii	*aureum* and *nobile* (Ainsworth).
Ainsworthii Cypher's var	*aureum* and *nobile elegans* (Cypher).
Ainsworthii intertextum	*aureum Lee's* var. and *nobile* (Veitch).
Ainsworthii splendidissimum (Fig. 72)	*nobile nobilens* and *aureum* (Veitch).
Alcippe	*lituiflorum Freemani* and *Wardianum* (Veitch).
Andromeda	*Leechianum* and *moniliforme (japonicum)*.
Apollo grandiflorum	*nobile pulcherrimum* and *splendidissimum grandiflorum* (Cypher).
Armstrongi	*aureum* and *nobile cærulescens* (Winn).
Aspasia	*aureum* and *Wardianum* (Veitch).
Astræa	*luteolum* and *crassinode* (Cookson).
Aurora	*Findlayanum* and *nobile* (Lawrence).
Backhousei	*nobile* and *thyrsiflorum* (Backhouse).
Benita	*aureum* and *Falconeri* (Brymer).
Berkeleyi	*Cassiope* and *Wardianum* (Berkeley).
Bryan	*luteolum* and *Wardianum* (Cookson).
Burberryanum	*Findlayanum* and *Dominianum* (Chamberlain).
burfordiense	*Linawianum* and *aureum* (Lawrence).
Cassiope	*moniliforme (japonicum)* and *nobile albiflorum* (Cookson).
cheltenhamense	*luteolum* and *aureum* (Cypher).
chlorostele	*Linawianum* and *Wardianum* (Lawrence).
chrysodiscum	*Findlayanum* and *Ainsworthii* (Lawrence).
Clio	*splendidissimum grandiflorum* and *Wardianum* (Lawrence).
Clytie	*Findlayanum* and *Leechianum* (Chamberlain).

Dendrobium.

Cordelia	*aureum* and *euosmum leucopterum* (Veitch).
Cordelia flavescens	*aureum* and *euosmum leucopterum* (Veitch).
Corningianum.....	*nobile* and *lituiflorum* (Corning).
crepidato-nobile	*nobile* and *crepidatum* (Veitch).
Curtisii.....	*Cassiope* and *aureum* (Sander).
Cybele	*Findlayanum* and *nobile* (Veitch).
Cybele nobilius	*Findlayanum* and *nobile nobilius* (Veitch).
Dalhou-Nobile.....	*pulchellum* (*Dalhousieanum*) and *nobile* (White).

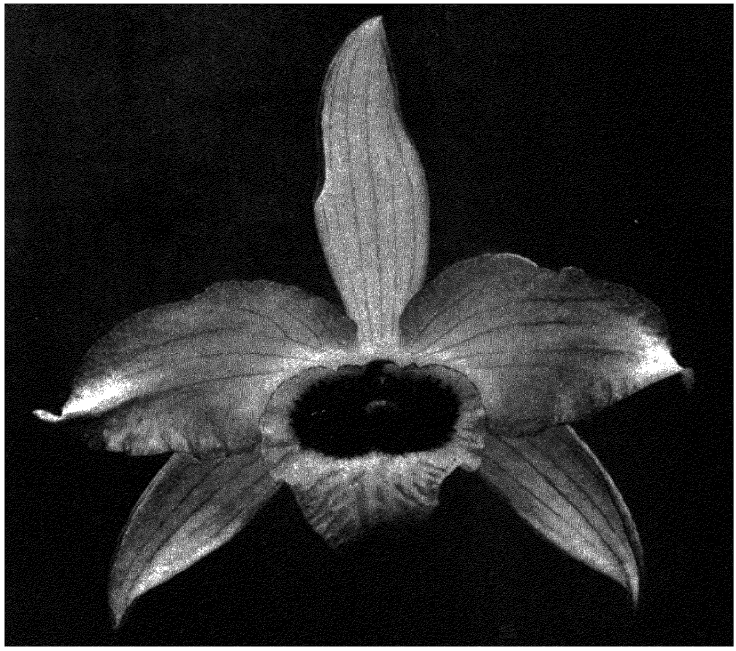


FIG. 72. FLOWER OF DENDROBIUM AINSWORTHII SPLENDIDISSIMA (nat. size).

dellense.....	*nobile Schraderianum* and *splendidissimum* (Schroeder).
Dido.....	*Findlayanum* and *Ainsworthii* (Lawrence).
Dominianum	*Linawianum* and *nobile* (Veitch).
Doris	*Lecchianum* and *moniliforme* (*japonicum*) (Veitch and Cookson).
dulce.....	*aureum* and *Linawianum* (Cookson).
Edithæ.....	*nobile nobilius* and *aureum* (Lee).

Dendrobium.

Ellisii *nobile* and *Hildebrandii* (Ellis).
endocharis *moniliforme* (*japonicum*) and *aureum* (Veitch).
Ethel..... *moniliforme* (*japonicum*) and *Rolfeæ roseum* (Cypher).
euosmum *endocharis* and *nobile* (Veitch).
euosmum virginale.... *endocharis* and *nobile intermedium* (Veitch).
Euryalus *Ainsworthii* and *nobile* (Veitch).
Euryclea *lituiflorum* and *Wardianum* (Veitch).
Euterpe *nobile* and *Wardianum* (Lawrence).
Farmerii - thyrsiflorum *Farmerii* and *thyrsiflorum* (Sander).
Findlayana Wardianum *Findlayanum* and *Wardianum* (Ashworth).
formoso-Lowii..... *formosum* and *Lowii* (Lawrence).
Galatea..... *moniliforme* (*japonicum*) and *Rolfeæ roseum* (Thwaites).
Gemma..... *superbum Huttoni* and *aureum* (Winn).
Harold *Findlayanum* and *Linawianum* (Cookson).
Hebe..... *Findlayanum* and *Ainsworthii* (Lawrence).
hesseliense *Findlayanum* and *splendidissimum grandiflorum* (Burkenshaw).
Holmesianum *Dominianum* and *Schneiderianum* (Hardy).
Hunterii *nobile* and *Brymeriana* (Hunter).
illustre *chrysotoxum* and *pulchellum* (*Dalhousieanum*) (Veitch).
Imogen..... *euosmum leucopterum* and *signatum*.
Isis *moniliforme* and *hercoglossa* (Cranstoun).
Juno..... *Linawianum* and *Wardianum* (Lawrence).
Kenneth *Bensoniæ* and *MacCarthiæ* (Cookson).
Kingiano-speciosum .. *Kingianum* and *speciosum* (Lawrence).
Leechianum..... *aureum* and *nobile* (Swan).
Luna..... *Findlayanum* and *Ainsworthii* (Lawrence).
Lutwycheanum *Wardianum* and *splendidissimum grandiflora* (Lutwych).
Mantinii *nobile* and *fimbriatum oculatum* (Mantin).
melanodiscum *Findlayanum* and *Ainsworthii* (Lawrence).
Melpomene *splendidissimum* and *signatum* (Lawrence).
Mentor *primulinum* and *superbum* (Veitch).
micans *lituiflorum Freemanii* and *Wardianum* (Veitch).
Minos *Findlayanum* and *Cassiope* (Statter).
Murrayi *nobile* and *albo-sanguineum* (Cookson).
Nestor *Parishii* and *superbum anosmum* (Winn).
Niobe *tortile* and *nobile* (Veitch).
Ophior..... *aureum* and *signatum* (Veitch).
Owenianum..... *Linawianum* and *Wardianum* (Sander).
pallens (Fig. 73)..... *Findlayanum* and *Ainsworthii* (Lawrence).
porphyrogastrum *pulchellum* and *superbum Huttoni* (Veitch).
radians..... *Lowii* and *sculptum*.
Rainbow *Findlayanum* and *Ainsworthii* (Lawrence).
rhodostomum *superbum Huttonii* and *sanguinolentum* (Veitch).
Rœblingianum *Ruckerii* and *nobile* (Pitcher).
rubens *Leechianum* and *nobile nobilius* (Cypher).
rubens grandiflorum.. *splendidissimum grandiflorum* and *nobile nobilius* (Cypher).
Sanderæ *nobile albiflorum* and *aureum* (Sander).
Schneiderianum *Findlayanum* and *aureum* (Hardy).
Sibyl..... *bigibbum* and *Linawianum* (Cookson).
specio-Kingianum *Kingianum* and *speciosum* (Lawrence).



FIG. 73. DENDROBIUM PALLENS
(nat. size)

Dendrobium.

splendidissimum *aureum* and *nobile* (Veitch).
Stafforddii *Cassiope* and *Bensoniæ* (Hardy).
Statterianum *Bensoniæ* and *crystallinum* (Statter).
striatum *japonicum* (*moniliforme*) and *pulchellum* (Veitch).
Thalia *Ainsworthii* and *nobile nobilius* (Lawrence).
The Gem *Ainsworthii* and *aureum* (Winn).

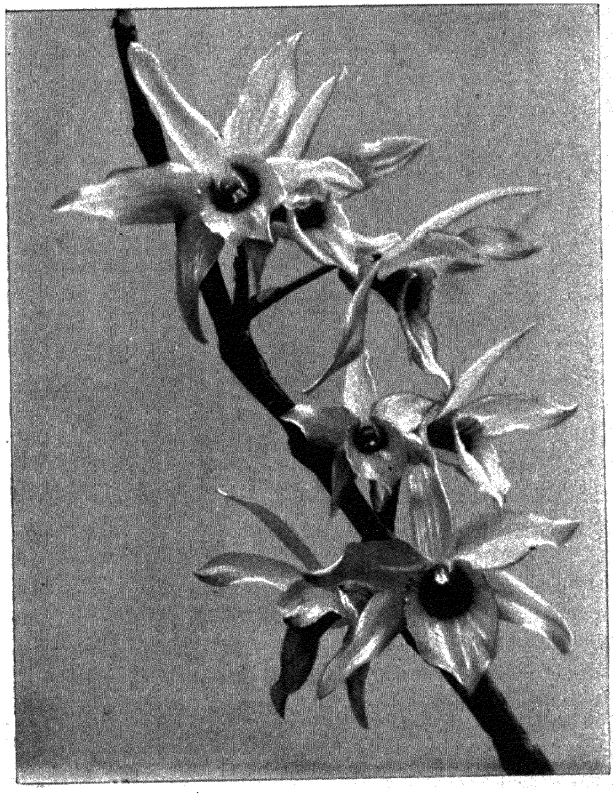


FIG. 74. DENDROBIUM WARDIANO-JAPONICUM
(nat. size).

Thompsonianum *nobile Cypherii* and *cheltenhamense* (Thompson).
Vannerianum *japonicum* (*moniliforme*) and *Falconeri* (Vanner).
Venus *Falconeri* and *nobile* (Cookson).
Vergile *nobile* and *Ainsworthii* (Haywood).
Virginia *moniliforme* (*japonicum*) and *Bensoniæ* (Veitch).
Vulcan *Juno* and *Wardianum* (Chamberlain).

Dendrobium.

Wardiano-aureum	*aureum* and *Wardianum* (Veitch).
Wardiano - japonicum (Fig. 74)	*moniliforme* (*japonicum*) and *Wardianum* (Veitch).
Wiganiæ	*nobile* and *signatum* (Wigan).
Wiganianum	*Hildebrandii* and *nobile* (Wigan).
xanthocentrum.....	*Findlayanum* and *nobile* (Lawrence).

NATURAL HYBRIDS.

barbatulo-chlorops	*barbatulum* and *chlorops*.
Boxallii	*crystallinum* and *crassinode*.
crassinodo-Wardianum	*crassinode* and *Wardianum*.
Donnesiæ	*formosum* and *infundibulum*.
Lecanum	*Phalænopsis* and *superbiens*.
melanophthalmum	*Wardianum* and *crassinode*.
Murrhiniacum	*Wardianum* and *nobile*.
Pitcherianum	*primulinum* and *nobile*.
polyphlœbium	*Pierardi* and *Parishii*.
rhodopterygium	*Pierardi* and *Parishii*.
Rolfeæ	*primulinum* and *nobile*.
Waltonii	Syn. *crassinodo-Wardianum*.
Wattii	*infundibulum* and *flexuosum*.

DENDROCHILUM (*Blume*). This is now included under **Platyclinis.**

DENDROPHYLAX.

Under the above name (from *dendron*, a tree ; and *phulax*, a defender; in allusion to the habit of the plants) the younger Reichenbach founded a genus of remarkable Orchids, belonging to the tribe *Vandeæ*. They practically consist of roots and flowers only, the leaves being very small, and often entirely wanting. Flowers solitary or few in a raceme ; sepals and petals sub-equal, free, spreading ; lip sessile at the base of the column, the base produced into a long spur, the lateral lobes short, the middle one two-lobed ; column very short, and broad ; scapes slender, simple. Roots densely fascicled. Pseudobulbs wanting.

Two species have been introduced, both natives of the West Indies. They enjoy a moist position in the stove or warm intermediate-house, and are best affixed to a piece of wood or to a shallow basket with a little sphagnum distributed among the roots. The plants

Dendrophylax.

should be kept in a fairly moist condition at all seasons of the year.

D. Fawcettii (*Rolfe*).—This species, which is much in the way of *D. funalis*, is a leafless plant with a tuft of long green roots springing from a very short stem. The flowers are 2in. in diameter, several on a scape, varying from 2in. to 24in. long; sepals and petals greenish-white, lanceolate, acute; lip white, with a slender spur 7in. long. 1888.

D. funalis (*Benth.*).—Flowers greenish-white, ½in. long; lip broad, about half as long as the subulate-filiform, straight-descending spur; scapes few-flowered, 1in. to 4in. long. 1846. Syn. *Angræcum funale*. (B. M., t. 4295.)

DIACRIUM.

The epiphytal Orchids of the tribe *Epidendreæ* that are included under Lindley's *Diacrium* are frequently included with *Epidendrum*. They are natives of Mexico, Central America, and Guiana. Flowers showy, loosely racemose, shortly pedicellate; sepals sub-equal, free, spreading, rather thick, petaloid; petals somewhat similar; lip spreading from the base of the column, nearly equalling the sepals, the lateral lobes spreading or reflexed, the disk elevated between the lateral lobes, two-horned above; column short and broad, slightly incurved; peduncle terminal, simple, with paleaceous sheaths—a characteristic that has given rise to the generic name—from *dia*, through, and *akris*, a point. Leaves few. Stems fleshy, scarcely thickened into an elongated pseudo-bulb. Only one species calls for mention. To provide its requirements is often difficult. It is a species that may be induced to grow satisfactorily for a few years, then it suddenly begins to deteriorate, and is with difficulty kept alive. The hot, humid conditions of the stove, with a pure, bright atmosphere, are likely to yield the best results. The plants should be grown in shallow, well-drained baskets, containing as little compost as possible about the roots. An abundant supply of water is necessary during the growing season, and the plant should not suffer from a lack of root moisture at any season of the year.

Diacrium.

D. bicornutum (*Benth.*).—Flowers pure white, with a few crimson spots in the centre of the lip; spikes produced from the tops of the pseudo-bulbs, many-flowered. Pseudo-bulbs

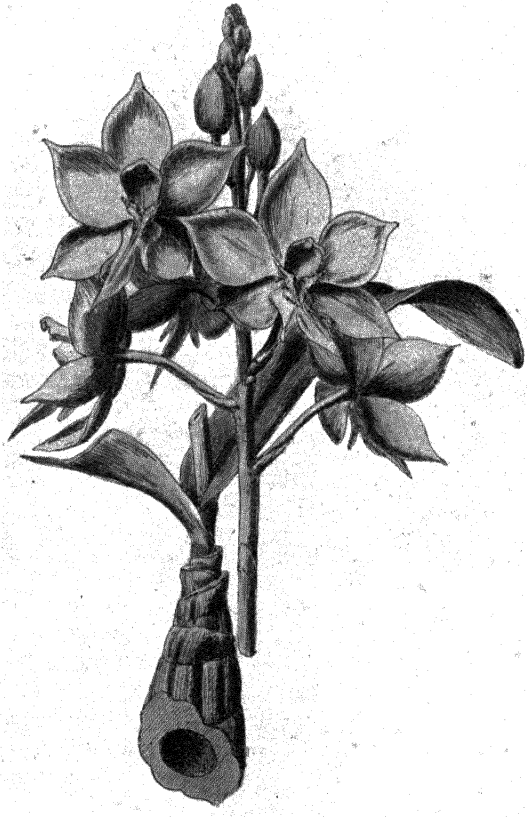


FIG. 75. FLOWER-SPIKE, LEAVES, AND PSEUDO-BULB OF DIACRIUM BICORNUTUM

(much reduced).

stout, 1ft. to 1½ft. high, hollow in the centre, and producing short, leathery leaves near the apex. West Indies. Syn. *Epidendrum bicornutum.* (Fig. 75; B. M., t. 3332.)

DICHÆA.

Stove epiphytal Orchids of the tribe *Vandeæ*, the genus being founded by Lindley. They are natives of the West Indies and tropical America. Flowers greenish, solitary, inconspicuous, axillary. Leaves small, ovate-oblong or linear, two-ranked (whence the generic name, from *dicha*, bifarious). Stems short, erect, or. creeping. There are about a dozen species known, but they are rarely seen in cultivation. They require stove-house treatment, and to be grown in baskets suspended from the roof.

DICRYPTA (*Lindl.*). This is now included under **Maxillaria.**

DIPLOPRORA.

A monotypic genus of the tribe *Vandeæ*, established by Hooker. The name is from *diploos*, double; and *prora*, a front. The species *D. Championi* (syn. *Cottonia Championi*) is an intermediate-house, epiphytal Orchid, having a few small yellow flowers, with a rosy-tinted lip, ovate or oblong distichous leaves, and a nearly simple stem. It is a native of India and Hong Kong. The plant is seldom met with in cultivation.

DIPODIUM.

By the above name is known a small genus of stove terrestrial Orchids of the tribe *Vandeæ*, founded by Robert Brown. The species are natives of the Malayan Peninsula and Archipelago, the Pacific Islands, and Australia. The name is from *dis*, twice; and *pous*, *podos*, a foot, and is in allusion to the caudicles on the pollen-masses. Flowers frequently dotted, rather large, in small racemes; sepals and petals sub-equal, free, spreading; lip erect, adnate to the column, slightly gibbous, or very shortly saccate at the base, three-lobed to the middle, the lateral lobes narrow or triangular, the middle one longer. Leaves, when present, narrow, coriaceous. Stems leafy at the base, or the floriferous ones leafless. The species occasionally met with in cultivation is *D. paludosum* (*Rchb. f.*). The cultural requirements are similar to those for *Bletia.*

DISA.

Over a hundred distinct species of the genus *Disa* (*Berg.*), belonging to the tribe *Ophrydeæ*, have been described. All of them are natives of Africa, mostly in the south temperate region. Of this number scarcely half-a-dozen are in cultivation in gardens here, and only two of these may be considered really good garden Orchids. The origin of the generic name is unknown. There is no doubt about the beauty of many of the species that as yet are unknown in English horticulture; but all efforts to establish them in gardens have invariably resulted in failure. This is due to the difficulty—impossibility, one might say—of reproducing artificially anything approximating to the conditions under which these plants grow naturally.

Flowers variously disposed, large or small; sepals much larger than the petals, the dorsal one erect, hooded, and having a spur; petals small, polymorphous; lip small, spurless, linear, acute, projecting forward; column short, rather thick; bracts usually shorter than the flowers. Stems sometimes tall and leafy, sometimes slender and few-leaved, or with leaves reduced to sheathing bracts.

The utility of this lovely genus has been considerably increased of late years by the successful introduction of several beautiful hybrids. These have proved far more amenable to culture than the imported species, and are often found to thrive well where failure has followed every endeavour to cultivate the African kinds. They should be fully represented, for they are very striking subjects when used for grouping with other Orchids at exhibitions; while for cut-flower work they are most useful.

Culture.—Disas are not so extensively cultivated as their merits deserve. No doubt this is due to the difficulty experienced in obtaining satisfactory results from *D. grandiflora* (Fig. 76). The cause of such failure is due rather to unsuitable climatic conditions than to any lack of ability on the part of the cultivator. Instances are known where, without any exceptional attention, these plants have been everything that could be desired. In one instance the plants were placed by the writer on a dry slate stage of a Heath-house, and he had the pleasure



FIG. 76. DISA GRANDIFLORA

(much reduced).

Disa.

of seeing them some sixteen years later, when their condition was eminently satisfactory. They had the full benefit of free ventilation throughout the year, and, except to exclude frost, no fire-heat was used.

During the growing season the plants should be freely syringed overhead, and a liberal supply of moisture afforded at the roots. The shading used should be only sufficient to prevent scorching of the foliage during the hottest parts of the day. The potting compost should consist of good fibrous peat, living sphagnum, and a liberal proportion of rough sand and broken potsherds intermixed. Free and ample drainage must also be provided. There are instances of *D. grandiflora* being grown successfully for many years, and then suddenly failing. This is often brought about after a lengthened period of dry weather. Thrips play havoc in a season of this description, and as an abundance of ventilation is necessary under such conditions, these pests obtain free access to the house, and quickly attack the tender shoots, disfiguring and often destroying them. Fumigation is naturally resorted to, but the remedy is worse than the disease, and many fine batches of plants have thus been destroyed. No apparent ill-effects will be observed for a few days, but suddenly a black spotting appears on the leaves, and this passes into the stems, and continuing a downward course, finally ends in the total decay of the growths. If the tubers escape injury (which is rarely the case) they commence growing again after a short period; but it takes a considerable time for plants thus weakened to regain their vigour. Where thrips are observed, the plants should be frequently sprayed with weak tobacco-water or some non-injurious (so far as plants are concerned) insecticide, or the plants may be dipped; but in this case great care must be taken, as the growths are so brittle that they quickly break should they come in contact with the sides of the bath.

The following species and hybrids are at present in commerce:

D. grandiflora (*Linn. f.*).—Rootstock tuberous. Stem erect, unbranched, 1ft. to 2ft. high, leafy. Lower leaves 6in. long, and dark green; the upper ones smaller, those near the flowers being reduced to bracts. Flowers terminal, from one to ten, or even

more being produced on each stem; upper sepal ovate, 3in. long, hooded, pointed at the apex, spurred at the base, deep rose-coloured, with carmine veins; side sepals ovate-oblong, 2½in. long, brilliant carmine-red; petals and lip small, tinted orange. Some varieties have the sepals orange-tinted, and others have the hooded sepal coloured rose-purple. Introduced from Table Mountain, near Cape Town, in 1825. Syn. *D. uniflora.* (Fig. 76, for which we are indebted to the Editor of the "Gardeners' Chronicle"; B. M., t. 4073.)

D. racemosa (*Linn. f.*).—Rootstock tuberous. Stem erect, proliferous at the base, unbranched, leafy. Lower leaves about 4in. long, the upper ones small, all shining green. Strong plants produce flower-stems 1½ft. high; these stems bear from six to twelve handsome flowers, which open in slow succession and remain fresh a long time; upper sepal ovate, concave, 1in. long, blunt at the apex, pouched at the base; side sepals spreading, 1in. long, ¾in. wide; petals and lip small, crimson and yellow; sepals large, coloured a beautiful rose, with darker veins. Introduced from South-east Africa in 1887. Syn. *D. secunda.* (B. M., t. 7021.)

D. secunda (*Sw.*).—A synonym of *D. racemosa.*

D. tripetaloides (*N. E. Br.*).—Mr. O'Brien, who introduced and flowered this species in 1889, says: "It is not only the freest-growing and most profuse-flowering Disa I ever saw, but also the most easily grown of all South African terrestrial Orchids." It has thick, fleshy roots, a stoloniferous stem, lance-shaped leaves, 6in. long. leathery in texture, and arranged in a compact rosette. The flower-stem is erect, 1½ft. or more long, and bears from twenty to thirty flowers; each flower is about 1½in. across, and is white, tinged with pink and dotted with rose-purple; the helmet-shaped dorsal sepal has a short spur. The plant remains in flower a long time. Although comparatively new to cultivation, this species was discovered more than a hundred years ago. (B. M., t. 7206.)

D. uniflora (*Berg.*).—A synonym of *D. grandiflora.*

Diores *Veitchii* and *grandiflora* (Veitch).
Diores-Clio *grandiflora* and *Veitchii* (Veitch).
kewensis *grandiflora* and *tripetaloides* (Kew).
langleyensis *racemosa* and *tripetaloides* (Veitch).
Premier *tripetaloides* and *Veitchii* (Kew).
Veitchii *grandiflora* and *racemosa* (Veitch).
Watsoni *kewensis* and *grandiflora* (Kew).

DISPERIS.

About a score of terrestrial Orchids of the tribe *Ophrydeæ* are included in the genus *Disperis* (*Sw.*)—from *dis*, double, and *pera*, a pouch, in reference to the shape of the sepals. The species are usually small and slender, natives of the East Indies, tropical and South Africa, and the Mascarene Islands. Flowers solitary or racemose; dorsal sepal erect, galeate or calcarate, the lateral ones spreading or oblique, free or more or less united; petals united to the dorsal sepal, falcately curved, usually constricted in the middle and obliquely acute or lobed at the apex; lip adnate to the face of the column, long-clawed above it, variously curved within the galea. Leaves one or few, alternate, or limited to a single opposite pair. Tubers ovoid. *D. Fanniniæ*, probably the only species now in cultivation here, should be grown like *Disa*.

DIURIS.

Of this genus of terrestrial Orchids, belonging to the tribe *Epidendreæ*, there are some fifteen species, all of them interesting, and some very beautiful, but practically unknown here. All are natives of Australia. Flowers one or more in a terminal raceme, often rather large and conspicuous, owing to the tail-like green lateral sepals (hence Smith's name, from *dis*, twice, and *ouris*, a tail). The rest of the perianth is yellow, purple, or white, often bright yellow, with deep purple spots or blotches. The prominent petals are often very spreading, the shorter dorsal sepal closely embracing the column at the base; the lip is three-lobed. The leaves are narrow. They require similar cultural treatment to *Bletia*, but should be kept in the cool greenhouse throughout the year.

DORITIS.

Five species of stove Orchids of the tribe *Vandeæ* are comprehended in the genus *Doritis* (*Lindl.*). The name is from *doru*, a lance, and is in reference to the form of the lip. The species are natives of India and Malaya, and possess the characters of *Phalænopsis*, but the column is

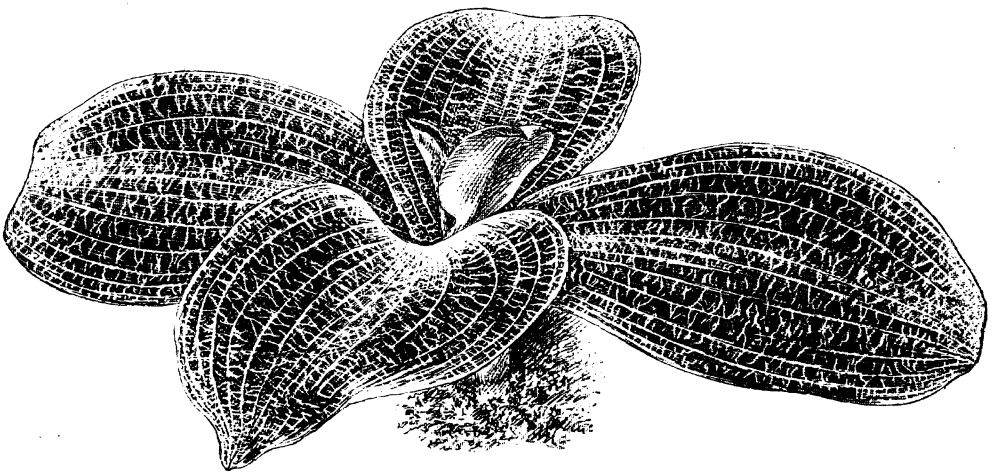


FIG 77. DOSSINIA MARMORATA
(much reduced).

Doritis.

narrowly winged, and its foot forms a conical mentum with the lateral sepals. Two species, *D. tænialis* (*Benth.*) and *D. Wightii* (*Benth.*), have been introduced, but are rarely found in cultivation outside botanic gardens. They require similar treatment to *Phalænopsis.*

DOSSINIA.

The only species in the genus *Dossinia* (*C. Morr.*), of the tribe *Neottiæ*, is a small terrestrial Orchid, nearly allied to *Anœctochilus*, but differing in the boat-shaped process of the column, as well as in the absence of a barbed fringe to the lower part of the lip. The genus is named in honour of E. P. Dossin, a Belgian botanist. The plant is better known in gardens as *Anœctochilus Lowii.* It should be grown like *Anœctochilus.*

D. marmorata (*C. Morr.*).—When well managed, this plant grows 6in. or more high, with a crowded rosette of leaves, 4in. long by 3in. wide, their texture being thick and succulent. The ground-colour of the upper surface is dark velvety-green, shaded with brown, and beautifully lined and veined with pale gold. The under surface is pale yellow, tinged with rose. Native of Borneo. (Fig. 77.)

EARINA.

About half-a-dozen species of epiphytal Orchids, of the tribe *Epidendreæ*, are included by Lindley in this genus. They are natives of the Pacific Islands and New Zealand. Their small flowers, crowded into sessile heads, are produced in spring; hence the name, from *earinos*, the spring; the lateral sepals and foot of the column form a chin. Though rarely found in cultivation outside botanic gardens, they are best cultivated in shallow pans or baskets suspended from the roof of a cool intermediate-house.

ELLEANTHUS.

Over fifty species of warm-house terrestrial Orchids, of the tribe *Epidendreæ*, are found under the name *Elleanthus*

Elleanthus.

(*Presl.*), a name derivable from *eilo*, I shut, and *anthos*, a flower, in reference to the latter being enclosed by bracts. Only a few species are found in cultivation, and these are rarely seen outside botanic collections. Flowers in terminal spikes; sepals and petals free, erect; petals often narrower than the sepals; column erect, semi-terete or two-winged in the middle. Leaves sessile, plicate. The species are best grown in pots, in a compost consisting of equal portions fibrous peat, leaf-soil, and sphagnum, with sufficient silver-sand to keep it in a porous condition. A moist position in the warm intermediate-house suits them well. *E. capitatus* (*Rchb. f.*) and *E. xanthocomus* (*Rchb. f.*) are the two species usually seen.

EPI-CATTLEYA.

Bigeneric hybrids whose parentage is sufficiently denoted by the name. They should be treated similarly to Cattleyas.

belairensis	*C. Forbesii* and *E. cochleatum* (Mantin).
guatemalensis	*E. aurantiacum* and *C. Skinneri* (Nat. Hyb.).
matutina	*C. Bowringiana* and *E. radicans* (Veitch).
Mrs. J. O'Brien	*E. O'Brienianum* and *C. Bowringiana* (Veitch).
Orpetiana	*E. O'Brienianum* and *C. guttata Prinzii* (Orpet).
radiato-Bowringiana ..	*C. Bowringiana* and *E. radiatum* (Veitch).
Sybil	*E. vitellinum* and *C. guttata* (Charlesworth).

EPIDENDRUM.

Linnæus founded this very extensive genus of the tribe *Epidendreæ*. It comprises about 400 species, natives of South America and the West Indies. They vary much in habit and size. Among them are many which are of little interest in the amateur's collection. All the species are epiphytes. Dr. Lindley says that the essential character of the genus consists in the lip being more or less united by a fleshy base to the edge of a column, which is hornless, and considerably elongated, but not petaloid and winged; in the pollen-masses being four, equal and compressed; and in the presence of a passage more or less deep at the base of the lip. The name Epidendrum (from *epi*, upon, and *dendron*, a tree) was at one time applied to nearly all the Orchids that were known to grow on trees; but it has since been limited to the plants possessing the above characters.

Epidendrum.

As this genus includes several plants hitherto known under *Barkeria* and other names, and as a considerable number of handsome-flowered species are of recent introduction, the list of useful garden Epidendrums is a fairly long one. Even those species that are wanting in ordinary attractions have characters of sufficient interest to recommend them to some amateurs. For instance, some of them are deliciously fragrant, as *E. fragrans*, *E. purum*, *E. radiatum*, &c. Only those known to possess good ornamental flowers are, however, described here.

Culture.—Nearly all the cultivated Epidendrums thrive when grown in the Cattleya-house and treated as if they were Dendrobiums. *E. vitellinum* is, however, an exception; its treatment is given under its description.

These somewhat despised Orchids have been of considerable value to the hybridist. The intercrossing of some of the showiest species has produced excellent results. By far the most interesting have been those instances where *Epidendrum* has been used as one of the parents in the production of bigeneric hybrids, such as *Epi-Cattleya*, *Epi-Lælia*, and *Epiphronitis*.

E. atropurpureum (*Willd.*).—In this species the pseudo-bulbs are ovate and wrinkled, bearing a pair of narrow, dark green, leathery leaves. From between the latter is produced a long spike, bearing several large flowers, which have spreading oblong sepals and petals, of a dark brown colour, greenish at the base; the lip is large, spreading, three-lobed, and pure white, with a feather-like blotch of reddish-purple at the base. A very handsome species, well deserving a place in the smallest collection of intermediate-house Orchids. It blossoms in spring and early summer. It is a native of Tropical America, from Costa Rica to Colombia, and was introduced in 1836. Syn. *E. macrochilum*. (B. M., t. 3534.)

Var. *roseum* has purple sepals and petals, and a rose-coloured lip.

E. aurantiacum (*Batem.*).—This free-flowering species in pseudo-bulbs and foliage approaches *Cattleya Skinneri*. The flowers are bright cinnabar-red, 1¼in. across, and produce in spring. This plant is now more correctly known as *Cattleya aurantiaca*.

E. bicornutum (*Hook.*).—This is now known as *Diacrium bicornutum*.

E. Brassavolæ (*Rchb. f.*).—Pseudo-bulbs pear-shaped, compressed, 6in or more long, bearing two oblong leaves 9in. long,

and a many-flowered, branching scape. Each flower measures 4in. across, the sepals and petals being narrow, curved, and brown-yellow in colour; the lip is rhomboid at the base, and pale yellow, narrowed to a long apical point in front, where the colour is pale purple. The flowers are very fragrant, especially in the evening. This curious and handsome-flowered species is easily grown if kept in the Cattleya-house. It blossoms in spring, and remains fresh several weeks. Central America, 1867. (B. M., t. 5664.)

E. ciliare (*L.*).—Pseudo-bulbs club-shaped, 6in. long, bearing two or three apical leaves, oval or oblong in shape, and blunt at the ends. The flower-scape is about 6in. long, and bears three to six whitish flowers, each about 5in. across, with narrow segments and a three-lobed lip, having a long point and deeply-fringed sides. The flowers vary in size and purity of colour; they are developed in winter, remain fresh for several weeks, and are deliciously fragrant. This is an old garden plant, having been introduced about 1795 from tropical America, where it is one of the most widely distributed of all Orchids. (B. M., t. 463.)

E. dichromum (*Lindl.*).—A dwarf-growing and very handsome plant. The clustered pseudo-bulbs are 3in. to 6in. long, supporting two or three dark green, leathery leaves, from 6in. to 1ft. or more in length. The scape is 1½ft. to 2ft. high, and many-flowered; the flowers are sometimes 2in. to 3in. in diameter, the sepals narrow, and the petals broad, bright rose in some varieties, in others white; the three-lobed lip is rich crimson, with a lighter margin. This species blossoms at various seasons. It requires tropical treatment and plenty of water whilst growing. When in flower it should be placed in an intermediate-house temperature. Bahia, 1843. (B. M., t. 5491.)

E. elegans (*Rchb. f.*).—A charming little plant, with slender pseudo-bulbs and pale green leaves. The racemes are small, and the flowers 2in. across; sepals and petals broad, spreading, rosy-lilac; lip spoon-shaped, 1in. long, white, dotted with crimson, with a large blotch of maroon-crimson in front; column broad, winged, spotted like the lip. It blooms in spring. Introduced from Mexico in 1837. Syn. *Barkeria elegans.* (B. M., t 4784.)

E. evectum (*Hook. f.*).—This species is easily cultivated, and from its healthy, well-furnished appearance at all times, and its free-flowering habit, it merits a place in all large warm greenhouse collections. It is a tall, free-growing plant, with reed-like pseudo-bulbs, 5ft. or more long, clothed with bright green foliage almost to the base Flowers in globose heads, on long peduncles

on the ends of the ripened pseudo-bulbs. Each head continues to develop fresh whorls of flowers as the lower ones fade, so that the plant remains in blossom almost all the year round. Each flower is ¾in. across, with a three-lobed lip, the colour being bright purplish-red. It is a native of Colombia, whence it was introduced some years previous to 1871. (B. M., t. 5902.)

The following, with several others similar to *E. evectum*, are in favour in some collections:

E. Frederici-Gulielmi (*Rchb. f.*) (flowers of a dark purple); *E. ibaguense* (*H. B. K.*) (flowers orange-scarlet); and *E. Schomburgkii* (*Lindl.*) (flowers vermilion-scarlet), are, broadly speaking, the same in habit and inflorescence as *E. evectum*, but they differ in the form and colour of their flowers.

E. falcatum (*Lindl.*).— Long creeping stems, from which spring thick, fleshy, lance-shaped, falcate, drooping leaves about 1ft. long, and glaucous green in colour, characterise this species. The flowers, which are usually produced in pairs, have spreading narrow sepals and petals, 2½in. long, and brownish-green in colour; the lip is dark yellow, three-lobed; the two side lobes are rounded, the middle one is narrow and spear-like. The flowers are usually developed in summer, and remain fresh for several weeks. This species may be planted in a basket, in peat and sphagnum, or fastened to a block and hung near the glass in an intermediate-house. Mexico to Guatemala; introduced in 1838.

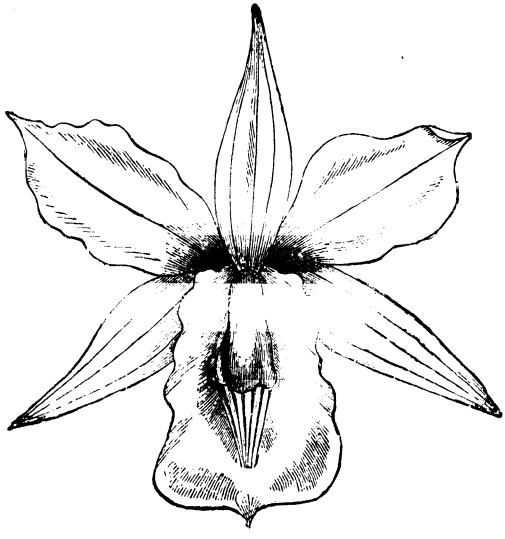


FIG. 78. FLOWER OF EPIDENDRUM LINDLEYANUM (nat. size).

E. Lindleyanum (*Rchb. f.*).— Pseudo-bulbs 1ft. long, as thick as a goose-quill. Racemes long, erect, bearing numerous large delicate flowers, similar in form to those of *E. elegans*, but rosy-purple in colour, the lip

being purple and white. The flowers appear in autumn. Native of Mexico and Costa Rica; introduced in 1839. Syn. *Barkeria Lindleyana.* (Fig. 78; B. M., t. 6098.)

E. macrochilum (*Hook*).—A synonym of *E. atropurpureum.*

E. Medusæ (*Benth.*).—Few Orchids present a more singular appearance than this. It has slender pendent stems 1ft. in length, covered with the flattened sheathing bases of the leaves. The oblong fleshy leaves are arranged in two opposite rows, and measure 2in. to 4in. in length; they are notched at the tips, and are of a pale glaucous green. The flowers, of which one to three are produced in the axils of the terminal leaves, are 2in. to 3in. in diameter, and of leathery texture; sepals and petals narrowly oblong, yellowish-green, faintly edged with purplish-brown; lip maroon-purple, orbicular, notched at the apex, and two-lobed at the base; it is 2in. in diameter, is furnished with a conspicuous fringe formed by the entire margin being divided into numerous long and pointed segments. Ecuador, 1867. Syn. *Nanodes Medusæ.* (Fig. 79; B. M., t. 5723.)

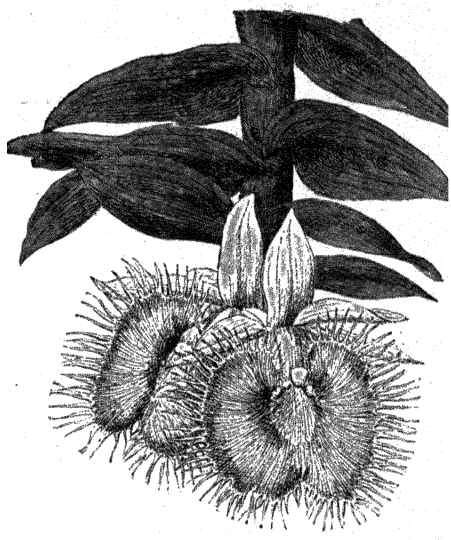


FIG. 79. FLOWERS OF EPIDENDRUM MEDUSÆ
(½ nat. size).

E. nemorale (*Lindl.*).—It is during summer that the fragrant flowers of this beautiful plant are borne. The pseudo-bulbs are conical, 4in. long, bearing a pair of strap-shaped, coriaceous, bright green leaves 1ft. long. The panicles are covered with warts, and are 2ft. to 3ft. long, and many-flowered; each flower is 4in. across, delicate in texture, the narrow, spreading sepals and petals being of a soft rose or delicate mauve; the lip is three-lobed, crenulate, white, lined with red, and has a marginal border of dark rose. Mexico, 1844. Syn. *E. verrucosum.* (B. M., t. 4606.)

Epidendrum.

E. prismatocarpum (*Rchb. f.*).—Very showy and attractive is the singular mixture of colours in the flowers of this evergreen plant. The pseudo-bulbs are flask-shaped, wrinkled, some 10in. or 12in. in height, and, together with the leaves, dark green. The erect scape bears a raceme of ten or twelve fragrant flowers; the lance-shaped, pointed sepals and petals are creamy-yellow, spotted with dark purple; the lip is small, rose-coloured, with a pale yellow margin. The plant blossoms during the summer months, and lasts several weeks if the flowers are kept dry. Central America, 1856. (B. M., t. 5336.)

E. radicans (*Pav.*).—Allied to *E. evectum*, but much more graceful, is this handsome species. It has long, thin stems, which are described as scandent when wild, and attaining a length of 9ft. or more. Leaves from 3in. to 5in. long, less than 1in. wide, fleshy, shining green. Long white roots are developed freely from every part of the stem, and these add to the attractiveness of the plant. Flowers numerous, nearly 2in. across, in terminal panicles; sepals and petals equal, spreading, ovate-lanceolate, bright orange-scarlet; lip stalk-like at the base, the upper part flat, three-lobed, and fringed; colour deep yellow, edged with scarlet. This gorgeous plant should be trained on a balloon or such-like trellis, and be kept in a moist stove always, being shaded only during very bright sunshine. It blossoms in spring and summer, the flowers lasting a long time. Guatemala, about 1839. Syn. *E. rhizophorum.*

E. rhizophorum (*Batem.*).—A synonym of *E. radicans.*

E. Skinneri (*Batem.*).—Habit as in *E. Lindleyana.* Flower-spikes erect, nearly 2ft. long, bearing a score or more flowers, which are as large as in *Barkeria elegans*, and soft rose in colour, paler on the lip. They are developed in October and November. Mexico and Guatemala, 1835. Syn. *Barkeria Skinneri.* (B. M., t. 3951.)

E. verrucosum (*Lindl.*).—A synonym of *E. nemorale.*

E. vitellinum (*Lindl.*).—A robust, dwarf-growing plant, thriving in a low temperature and moist atmosphere; it is one of the brightest-coloured of all Orchids. The short, egg-shaped pseudo-bulbs and narrow leaves are glaucous green; the racemes are erect, from 15in. to 18in. in height, bearing numerous thick and fleshy flowers, which have lance-shaped, orange-scarlet sepals and petals, and a bright yellow lip. The unusual colour of

the flowers, and the long time that they last in full beauty (fully two months), render this a most desirable plant. It blossoms during summer, and being a sub-alpine is very easily cultivated. It may be grown in shallow pans or pots, and as regards temperature, treated similarly to *Odontoglossum*. It likes plenty of sunlight. Mexico, 1839. (B. M., t. 4017.)

Var. *majus* is really larger-flowered than the type. As a rule, however, all the plants in cultivation are called *E. vitellinum majus*, however poor in flower they may be.

E. Wallisii (*Rchb. f.*).—A distinct and pretty-flowered species, with reed-like stems 2ft. to 4ft. high, and covered with raised dots of purple. The leaves are 4in. long, and arranged in two regular series. The flowers are produced from the top of the stems, and are either terminal or axillary; strong stems bear several bunches of flowers, each of which remains fresh for six weeks or more. The blossoms are 2in. across; sepals and petals equal, strap-shaped, yellow, spotted with crimson; lip large, fan-shaped, white, with feathery lines of crimson. Healthy plants are in flower quite half the year, and the flowers have a sweet, musk-like odour. This species should be grown in a warm, moist house. It requires plenty of water all the year round, as, indeed, do all the species with tall, reed-like stems. Colombia, 1874. (W. O. A., ii., t. 74.)

We append a list of recorded hybrids, with their parentage :—

Berkeleyi	*Stamfordianum* and *O'Brienianum* (Berkeley).
Clarissa	*elegantulum* and *Wallisii* (Veitch).
dellense	*xanthinum* and *radicans* (Schrœder).
elegantulum	*Endresio-Wallisii* and *Wallisii* (Veitch).
elegantulum leucochilum	*Endresio-Wallisii* and *Wallisii* (Veitch).
elegantulum luteum ..	*Endresio-Wallisii* and *Wallisii* (Veitch).
Endresio-Wallisii	*Endresii* and *Wallisii* (Veitch).
Endresio-Wallisii superbum.....	*Endresii* and *Wallisii* (Veitch).
James O'Brien	Syn. *O'Brienianum*.
langleyense	*pseudepidendrum* and *Wallisii* (Veitch).
O'Brienianum.....	*evectum* and *radicans* (Veitch).
O'Brienianum roseum	*evectum* and *radicans* (Veitch).
orphanum	Syn. *Endresio-Wallisii* (Sander).
Phœbus	*O'Brienianum* and *vitellinum* (Veitch).
radicanti - Stamfordianum.....	*Stamfordianum* and *radicans* (Veitch).
radico-vitellinum.....	*vitellinum* and *radicans* (Veitch).
Wallisio-ciliare	*ciliare* and *Wallisii* (Veitch).
xantho-radicans	*xanthinum* and *radicans* (Sir T. Lawrence).

EPI-LÆLIA.

These are bigeneric hybrids, obtained by the intercrossing of *Epidendrum* and *Lælia*. They require intermediate-house treatment.

Belairensis *E. ciliare* and *L. autumnalis* (Mantin).
Charlesworthii..... *E. radicans* and *L. cinnabarina* (Charlesworth).
Eros.. *E. ciliare* and *L. Dayana* (Veitch).
Hardyana *E. ciliare* and *L. anceps* (Sander).
Heatonense *L. cinnabarina* and *E. Wallisii* (Charlesworth)
radico-purpurata *E. radicans* and *L. purpurata* (Veitch).

EPI-PHRONITIS.

Under the above name is found a most beautiful and interesting bigeneric hybrid, a product of *Epidendrum radicans* and *Sophronitis grandiflora*. The flowers are very lasting, and bright as to colour. The plant requires intermediate-house treatment.

Veitchii..... *E. radicans* and *S. grandiflora* (Veitch).

ERIA.

More curious than beautiful fairly well describes this large genus of stove epiphytes of the tribe *Epidendreæ*, for which Lindley stands sponsor. The name is from *erion*, wool, and is in allusion to the downy leaves of some species. India, South China, and the Malay Archipelago are the habitats of the species, which require intermediate-house treatment. Flowers solitary or racemose, lateral or apparently terminal on the leafy stems or pseudo-bulbs; column short, produced at the base in a foot. Leaves variable. The plants are best cultivated in well-drained baskets or shallow pans, suspended near the roof-glass. The potting compost should consist of fibrous peat and sphagnum in equal proportions.

ERIOPSIS.

Three or four species of epiphytal Orchids, of the tribe *Vandeæ*, and coming from Northern Brazil, Guiana, and Colombia, are classed under *Eriopsis* (*Lindl.*). The generic name is from *Eria*, and *opsis*, like, from the

Eriopsis.

similarity to that plant when not in flower. Flowers showy, pedicellate; sepals equal, spreading, free, or the lateral ones connate with the foot of the column in a very short chin; petals similar to the sepals; lip affixed to the foot of the column, shortly incumbent, at length erect, the lateral lobes broad, erect, loosely enfolding the column, the middle one small, spreading, entire or two-lobed. Leaves usually two, long, ample.

Probably the only species in general cultivation is *E. rutidobulbon* (*Hook.*), a curious plant, having brown and yellow flowers, produced on a scape a foot or more long. It is best accommodated in well-drained baskets, the potting compost consisting of two parts fibrous peat to one of sphagnum. An abundance of moisture should be given during the season of growth, and the plant should be kept in the warm intermediate-house, cooler conditions being afforded during the resting season.

ERYCINA.

Lindley founded this monotypic genus of the tribe *Vandeæ*, the name being one for Venus, from Mount Eryx, a mountain in Sicily, where she had a temple. The species is a singular little Oncidium-like Orchid, differing markedly from that genus in the structure of the lip and column, the former being almost equally three-lobed, while the latter is short, thick, and wingless. *E. echinata* (B. M., t. 7389) has yellow flowers, two-thirds of an inch in diameter. It requires the same cultural conditions as *Oncidium*.

ESMERALDA (*Rchb. f.*). This is now included under **Arachnanthe.**

EULOPHIA.

A large genus of stove, terrestrial Orchids, of the tribe *Vandeæ*, a few species of which are interesting and pretty. The name was bestowed by Robert Brown, and is derived from *eulophos*, beautiful crested, in allusion to the furrowed lip. Flower-scapes either simple or branched, bearing either few or many flowers; sepals and petals nearly equal; lip pouched or spurred, with an entire or

Eulophia.

trilobed limb, bearded or crested in the middle. Leaves grassy, or lance-shaped and plaited. The conditions recommended for the deciduous section of *Calanthe* generally meet the requirements of these plants, which are rarely found in cultivation outside botanic collections.

EULOPHIELLA.

Rolfe founded this small genus (two species) of stove Orchids, of the tribe *Vandeæ*. They are allied to *Cyrtopodium*, from which they differ in habit, and in the absence of a mentum, the perianth being hemispherical and equally rounded at the base. The generic name is a diminutive of *Eulophia*. The species are natives of Madagascar. They require a hot, moist position in the stove, but the creeping nature of the rhizome renders them somewhat difficult subjects to accommodate. It is advisable to give them a liberal amount of pot-room. The best compost consists of good fibrous peat and sphagnum, with a free sprinkling of broken crocks. Eulophiellas should have a liberal amount of moisture while growing, and they must not be allowed to suffer from want of moisture at any period. Constant observation is necessary to keep the plants clear of thrips or other insects, especially while the growths are in a young and tender state. The best means of keeping insect pests in check is to frequently fumigate and carefully sponge the plants.

E. Elizabethæ (*Lind.* and *Rolfe*).—When this species was introduced a few years ago great things were expected of it; but the flowers proved most disappointing. They are white, slightly flushed with pale pink, 1½in. across; the back of the sepals, ovary, and scape are a dull purple; the sepals are orbicular; the lip is much smaller than the sepals, and has a deep yellow disk; the flowers are produced in racemes in April. The leaves are some 2ft. long, 1½in. broad, narrow-lanceolate. The rhizome is creeping and rooting, sending up green annulate pseudobulbs, 4in. to 6in. high. Introduced in 1892. (B. M., t. 7387).

E. Peetersiana (*Kranz.*).—This is a somewhat remarkable plant, resembling closely the members of *Lissochilus*. It is of more recent introduction than the preceding—1896. The

Eulophiella.

flowers are rose-coloured, and borne in axillary spikes; the lip is large; the lateral lobes are oblong, the middle one being bilobed. The rhizomes are yellowish-white and Iris-like. Syn. *Grammatophyllum Rœmplerianum.*

FERNANDEZIA (*Lindl.*). This is now included under **Lockhartia.**

GALEANDRA.

About ten species, all natives of tropical America, are included under Lindley's name for this genus, of the tribe *Vandeæ*. Three or four only are worth cultivating; these, when their requirements are properly understood, are very satisfactory, because of the beauty of the flowers and the long time they remain in perfection. They have erect, stem-like pseudo-bulbs, bearing several long and narrow leaves in two opposite rows, and producing the inflorescence from the top as soon as growth is completed. The distinctive part of the flower is the lip, which is large and somewhat funnel-shaped. The generic name is from *galea*, a helmet, and *aner*, *andros*, a stamen; in reference to the crested male organ on the top of the column.

Culture.—The greatest success is attained by growing the plants in well-drained pots or baskets of fibrous peat and sphagnum, in a light position near the glass in the warm house, with copious supplies of water during the time of active growth. When that period is over, they must be removed to cooler quarters, and the amount of water at the roots proportionately reduced. Their greatest enemies are thrips and red spider: these must be closely guarded against by keeping a moist atmosphere about the plants, and by occasional fumigation and dipping.

G. Baueri (*Lindl.*).—A pretty-flowered species, with three-nerved, lance-shaped leaves, and pseudo-bulbs about 1ft. high, bearing from the top a drooping raceme of flowers, each being about 2in. across. The sepals and petals are narrowly oblong and pointed; they are brownish-green in colour, the petals being slightly darker. The lip is broad at the front, narrowing to a spur at the base, with the edges curling above the column; the front portion is purple, and the outside white. The species flowers from June

to August, and is a native of South Mexico, Guiana, and Guatemala. Syn. *G. cristata.* (Fig. 80; B. R., 1840, t. 49.)

Var. *lutea* has flowers of a deep yellow colour, the front of the lip being marked with blood-coloured lines. (B. M., t. 4701.)

G. cristata (*Lindl.*).—A synonym of *G. Baueri.*

G. devoniana (*Schomb.*).—Growing in its natural state the pseudo-bulbs of this species reach a height of 5ft. to 6ft.: under cultivation, however, they are rarely more than about 2ft. long. They are round and erect, producing from the apex a pendent flower-scape. The beautiful flowers are 3in. to 4in. across, having darkish purple sepals and petals, the edges of which are green. The ground-colour of the lip is white, the apex being beautifully striped with purple. This species was first discovered by Schomburgk on the banks of the Rio Negro—a tributary of the Amazon—and introduced in 1840. (B. M., t. 4610.)



FIG. 80. FLOWERS OF GALEANDRA BAUERI (⅓ nat. size).

G. nivalis (*Hort.*).—This scarce and pretty species produces a pendent raceme of flowers from the top of the erect, tapering, and greyish-coloured pseudo-bulbs. The leaves are long and narrow, and the flowers measure about 2in. in length. The sepals and petals are olive-coloured, narrow, and reflexed; the funnel-shaped lip is white, with a violet blotch in the centre. A native of tropical America; introduced in 1882. (G. C., xvii., n. s., fig. 85.)

GEODORUM.

Warm intermediate-house terrestrial, tuberous-rooted Orchids, of the tribe *Vandeæ.* Two species are sometimes

Geodorum.

found; they are natives of East India. The name *Geodorum* (*Jacks.*) is from *ge*, the earth, and *doron*, a gift. Scapes terminating in a nodding spike of flowers, which sometimes are of a pale green, and having the white lip veined with purple or yellow-brown lines; while in others they are blush, with a yellow spot on the lip. Leaves radical, lance-shaped, or elliptical. The species—*G. candidum* (*Wall.*) and *G. dilatatum* (*R. Br.*).—thrive in a compost of fibrous peat, a little rough sand, some leaf-soil, and a small portion of loam. While in an active state they like a warm, moist position, and should receive every encouragement to induce free growth. As soon as the leaves have withered, a prolonged season of rest should be given.

GOMEZA.

Robert Brown founded this genus of stove, epiphytal Orchids, of the tribe *Vandeæ* It was named in compliment to Bernardino Gomez, a surgeon in the Portuguese Navy, who wrote on the plants of Brazil, of which country the species are natives. Flowers pale yellow or greenish, inconspicuous, but usually fragrant; lip affixed at the base of the column, continuous, incurved-erect or erect from the base, at length reflexed, spurless; column erect, semiterete; racemes often many-flowered; scape axillary, under the pseudo-bulb, simple. Leaves contracted to a rather broad petiole. The species, which are of botanic interest only, require similar cultural conditions to the Brazilian Miltonias, but are best accommodated in small pans or baskets. *G. crispa* (*Klotzsch*) is sometimes grown as *Rodriguezia crispa.*

GONGORA.

Though the genus *Gongora* (*Ruiz.* and *Pav.*) is a somewhat numerous one, including as it does *Acropera* (*Lindl.*), it is chiefly of botanic interest, the species being regarded as curiosities. It belongs to the tribe *Vandeæ*, and is named after D. Antonio Cabellero, of Gongora, once Viceroy of New Grenada (Colombia) and a patron of Mutis. The species

Gongora.

are epiphytes, with the habit of *Stanhopea*, but smaller, and bearing loose, pendent racemes of singularly-formed flowers. They should be treated as advised for *Acineta.*

G. armeniaca (*Rchb. f.*).—Leaves lance-shaped, light green; spikes 1ft. long, pendent, bearing about a dozen orange-yellow flowers in the summer. Nicaragua. Syn. *Acropera armeniaca.* (B. M., t. 5501.)

G. galeata (*Rchb. f.*).—Flowers curved inwards, very fragrant, light brown, in short, large-flowered racemes. Flowering season, summer. Mexico. Syn. *Acropera Loddigesii.* (B. M., t. 3563.)

G. gratulabunda (*Rchb. f.*)—Flowers yellow, much dotted with dull red, in a loose, many-flowered raceme; sepals with revolute margins, the dorsal one erect, the lateral ones reflexed. Leaves oblong, lanceolate, caudate-acuminate. Pseudo-bulbs oblong, strongly and acutely ribbed. Colombia, 1857. (B. M., t. 7224.)

G. maculata (*Lindl.*).—This is one of the most interesting species of the genus. The flowers are yellow, spotted with rosy-red, and in pendulous racemes more than 1ft. long. Pseudo-bulbs ribbed. Tropical America. (B. M, t. 3687.)

Var. *alba* is wholly white, save for some pink spots on the lip. It is also known as *grandiflora.*

GOODYERA.

Robert Brown founded this genus of terrestrial Orchids, of the tribe *Neottieæ*, and its name is a complimentary one to John Goodyer, a British botanist who assisted Johnson in his edition of Gerard's "Herbal." It has been much confused, and many of the species formerly included here are now referred to *Hæmaria.* The stove kinds like *G. Rollissoni* require similar culture to *Anœctochilus*, while North American species like *G. pubescens* (*R. Br.*) *G. p. minor*, and *G. Menziesii* (*Lindl.*), and European species like *G. repens*, are hardy.

G. Rollissonii (*Hort.*).—This is a beautiful Orchid, having velvety dark green foliage veined with yellow, while the under surface is stained with purple-brown. This plant has acquired many names, and is the *Macodes Rollissonii* of Rolfe, and the *Anœctochilus Rollissonii* and the *Hæmaria Rollissonii* of gardens.

GRAMMANGIS.

Though several species of *Grammangis* (*Rchb. f.*) are known, only one has yet been introduced. The genus belongs to the tribe *Vandeæ*, and is allied to *Cymbidium*. The generic name is from *gramma*, writing, and is probably in reference to the flower markings. Formerly *G. Ellisii* was known as a *Grammatophyllum*. The genus *Grammangis* is, however, differentiated from the latter in the way its pollen-masses are attached, and also in respect of the position of its foliage. The culture is as for *Grammatophyllum*.

G. Ellisii (*Lindl.*).—This species is of convenient size, free-flowering, and when in blossom it is most attractive. The pseudo-bulbs are from 12in. to 14in. high, somewhat four-angled and fusiform. The leaves are arching, broadly strap-shaped, and from 1½ft. to 2ft. long. The flowers are produced in a graceful, curving raceme, thirty or forty occurring together; they are large, and have a bright, varnished appearance. The sepals (the upper one is arching, and the side ones are cupped or gibbous) are tawny-yellow, with several transverse, reddish-brown lines towards the base, a similarly-coloured blotch occurring near the pointed tip; the petals are smaller; and the lip is white, with a pinkish tinge. The species flowers in July and August from the base of the young growths. It was introduced from Madagascar by the late Rev. Mr. Ellis (after whom it is named). Syn. *Grammatophyllum Ellisii*. (B. M., t. 5179.)

GRAMMATOPHYLLUM.

Of this genus, founded by Blume, five or six species are known, but they are not often seen under cultivation; when well grown and flowered, they are, nevertheless, very handsome and striking plants. It belongs to the tribe *Vandeæ*. The pseudo-bulbs are of large size, and bear stout, oblong, pointed leaves in opposite rows. The loose racemes of numerous flowers are produced from the base of the pseudo-bulbs. The flowers are large, and showily coloured. The species are natives of Madagascar, Malacca, and the Malayan Peninsula and Archipelago. The generic name is from *gramma*, writing, and *phyllon*, a leaf, and is thought to be in reference to the leaf-markings.

Culture.—Grammatophyllums do not lend themselves to our artificial conditions so freely as most Orchids, therefore

Grammatophyllum.

more than ordinary care is required in their management. Indeed, we should not advise the amateur to commence the cultivation of these plants until he has become familiar with the treatment of more easily-grown Orchids. The plants should be grown in perfectly drained pots or baskets, and as they root freely and resent disturbance, these should be of rather large size. A compost of peat fibre and sphagnum suits them best, to which may be added, as potting proceeds, pieces of charcoal or broken brick. They must be liberally supplied with water during active growth ; but after they have become well established, a decided period of rest is needed to ensure their flowering. All the species enjoy a light position near the roof-glass in the East Indian-house, with cooler conditions while in a dormant state.

G. Ellisii (*Lindl.*).—A synonym of *Grammangis Ellisii.*

G. Fenzlianum (*Rchb. f.*).—Flowers 2¼in. in diameter, in large clusters ; sepals and petals pale greenish-yellow, spotted with brown ; petals narrower and reflexed ; lip yellowish, obliquely striped with brown, the mid-lobe reflexed, while between the side lobes is a channelled, white plate ; scapes 3ft. to 4ft. long, many-flowered. Leaves 1ft. to 1½ft. long, oblong or lanceolate-oblong. Stems pseudo-bulbous, 4in. to 6in. long. Amboyna.

G. Gulielmi II. (*Kranzl.*)—A synonym of *G. Rumphianum.*

G. Measuresianum (*Hort.*).—A synonym of *G. Rumphianum.*

G. Rœmplerianum (*Rchb. f.*).—A synonym of *Eulophiella Peetersiana.*

G. Rumphianum (*Miq.*).—This is a showy, much-confused species, having sepals and petals pale yellowish-green, spotted with brown, the petals being narrower and reflexed ; lip three-lobed, yellowish, obliquely striped with brown, the mid-lobe reflexed, white, lined with purple inside. Pseudo-bulbs tufted, 6in. to 9in. long. Moluccas. Syns. *G. Gulielmi II.*, *G. Measuresianum*, and *G. Seegerianum.*

G. Sanderianum (*Hort.*).—A synonym of *G. speciosum.*

G. Seegerianum (*Hort.*).—A synonym of *G. Rumphianum.*

G. speciosum (*Blume*).—The flowering of this remarkable Orchid (the giant of its race) in the collection of Sir Trevor Lawrence, Bart., at Burford, Dorking, in 1897, was one of the most

Grammatophyllum.

interesting events in the Orchid World. Only on four previous occasions had it flowered in Europe: in Messrs. Loddiges' Nursery, at Hackney, in 1852; in the collection of Sir G. Taunton, at Leigh Park; in the collection of Mr. W. G. Farmer, Nonsuch Park, Ewell; and imperfectly in the collection of the late Mr. John Day, of Tottenham. To illustrate the gigantic proportions attained by this species in its native countries, Mr. J. H. Veitch, in his "A Traveller's Notes," speaks of one in the Botanic Gardens at Penang as being 42½ft. in circumference, its shoots from 6ft. to 7ft. long, and its seed-pods 7½in. long (including their foot-stalks) and 2½in. in diameter. One of last year's racemes, of which there were thirty, was 7¼ft. long. Mr. Veitch also adds that the plant was in fine condition, nearly all the shoots being clothed with foliage of a good colour. The same writer also gives particulars of a plant of even more gigantic proportions that was in the Botanic Gardens at Bulenzorg, Java. This had forty-six racemes of flowers, some with twenty-four open blossoms, and many more buds to expand. The plant was 15ft. through, and had stems 9ft. long. It will be gathered from these particulars that to cultivate this species, a house of considerable proportions will be required. It grows satisfactorily under the same conditions as those afforded to stove plants generally. It should be placed in a position where it can obtain all the available light, only sufficient shading to prevent actual scorching of the leaves being afforded. It should have a liberal supply of moisture, both at the roots and in the atmosphere, during the growing season, with drier conditions during the period of rest. It is an interesting and a wonderful plant. *G. Sanderianum* is really identical with this species.

GROBYA.

Lindley's name for a genus containing two species of greenhouse epiphytal Orchids, of the tribe *Vandeæ*, natives of Brazil. It was named in compliment to Lord Grey, of Groby, a munificent patron of Horticulture, who died in 1836. Flowers yellow or greenish, tinged and spotted with purple, in short racemes; petals broader than the sepals, forming a short helmet overhanging the lip; lip small, five-lobed at the apex. Leaves grass-like, ribbed at the apex. Pseudo-bulbs ovate. The plants require similar cultural conditions to *Stanhopea.*

Grobya.

G. Amherstiæ (*Lindl.*)—Flowers ochre-spotted, in pendulous racemes, produced in late summer. Leaves linear, acute, sheathed. Pseudo-bulbs ovate, green, terete. 1829. (B. R., t. 1740.)

G. galeata (*Lindl.*)—Flowers green, purple-spotted, produced in summer; petals oblong, obliquely rhomboid, rounded at the tip, disposed into a helmet along with the dorsal sepal (whence the specific name); lateral sepals deflexed, connate at base; lip tripartite; lateral segments linear, middle one cuneate-truncate, with a toothed disk, warted from shining tubercles. 1836.

GYMNADENIA. This is now included under **Habenaria.**

HABENARIA.

Over 400 species are known as belonging to the genus *Habenaria* (*Willd.*), of the tribe *Ophrydeæ*; as at present understood it includes *Gymnadenia.* They consist of stove, greenhouse, or hardy terrestrial Orchids, but quite an insignificant proportion figure as cultivated plants, interesting and sometimes showy though they be. In habit they resemble *Orchis.* Flowers spicate or racemose; sepals sub-equal, free or cohering towards the base; petals often smaller, sometimes deeply two-lobed; lip continuous and often very shortly connate with the column, having a short or long strap-shaped spur (hence the name, from *habena*, a thong or strap), and a spreading or pendulous, undivided or three- to five-lobed lamina, the lateral lobes sometimes pectinate-fringed or ciliated; column very short. The new introductions which in recent years have been made to this somewhat neglected genus of plants have proved interesting, showy, and desirable. Such kinds as *H. carnea*, *H. c. nivosa*, *H. pusilla*, and the large pure white *H. Susannæ*, are suitable for stove-house culture. They are deciduous and tuberous-rooted. Like most other tuberous-rooted stove-plants, they must have careful attention while in the resting state, and they must not, under any consideration, be allowed to shrivel through lack of sufficient moisture, but enough only must be given to maintain them in a plump condition.

Culture.—The pots used should be as small as possible. First secure the drainage by placing a large crock over the hole at the base, then add sufficient broken crocks to

Habenaria.

raise the crown of the tuber to within ½in. of the rim. Next fill to about one-half the depth of the tuber with small, clean crocks, on which should be placed a thin layer of sphagnum. The remaining space should be filled, so that the tuber is just covered, with the following compost: One half should consist of good fibrous peat, loam, and chopped sphagnum in equal proportions, and the other of finely broken crocks and a liberal sprinkling of rough silver-sand. The whole should be thoroughly mixed before using. When potting has been done, the plants should be placed in a light position in the stove, and be kept sufficiently near the glass to prevent them from being "drawn." They should then be freely sprinkled with a fine-rosed can, using slightly chilled water. As growth advances, the plants will require more pot-room. This should be done without disturbing the existing potting compost more than is really necessary: one shift should be sufficient for the season. Large "sixties" will be found ample for the small-tubered kinds, but "forty-eights" will be necessary for the larger-growing ones. For large pots the potting compost should not be so finely broken as when the smaller sizes are used. The tubers require only a moderate amount of water at the roots until they get into full growth; then a liberal supply must be provided, and every inducement given to encourage their development by atmospheric moisture; slight overhead syringings will be found beneficial in bright weather. Care must be taken to shade the plants from the bright scorching rays of the sun. Observation must be constantly kept for such pests as Thrips and Red Spider, which attack the leaves and centres of the growths, and quickly disfigure the plants. Where these are found, the house should be fumigated, and the necessary steps taken for their destruction. When the flowering season is over, the plants should be allowed to die down or dry off naturally, and stood on a dry shelf near the light, where they could be kept under observation until the potting season comes round. The stock may be increased by dividing the tubers at the time of potting.

Besides the stove species and varieties there are a number of hardy ones that would be interesting in a bog

Habenaria.

garden. They thrive best in peat. The best of the hardy kinds are dealt with separately at the end of the work.

H. Bonatea (*Rchb. f.*).—A synonym of *Bonatea speciosa.*

H. candida (*Dalz.*).—A synonym of *H. subpubens.*

H. carnea (*N. E. Br.*).—Flowers larger than those of *H. pusilla*; helmet-shaped portion of a beautiful pink, the remainder white; spur 1½in. long; scape erect, three- to five-

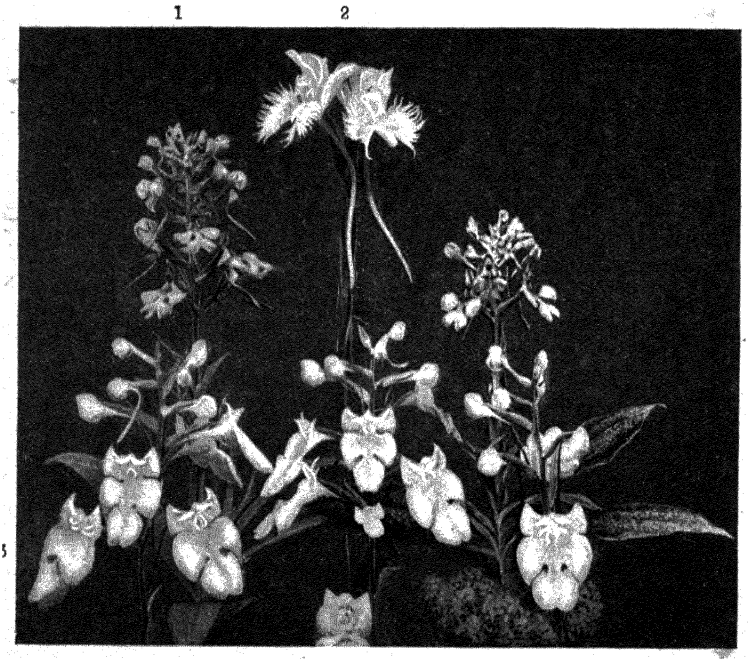


FIG. 81. HABENARIAS: 1. H. PUSILLA; 2. H. SUSANNÆ; 3. H. CARNEA (much reduced

flowered. Leaves small, dark green, thickly spotted with white. Penang, 1891. A handsome species. (Fig. 81; G. C., 1891, x., p. 729, fig. 105; G. & F., 1891, iv., p. 475, fig. 76; J. H., 1893, xxvii., p. 283, fig. 40.)

Var. *nivosa* (Syn. *alba*, Gn., 1896, i., p. 182, t. 1005), has white flowers.

Habenaria.

H. ciliaris (*R. Br.*).—This is a beautiful species known popularly in America as the Yellow Fringed Orchis. The flowers are a bright orange, in dense clusters, and have a beautifully fringed lip; they are produced in August. Stems 1½ft. to 2ft. high. North America, 1796. (B. M., t. 1668.)

H. cinnabarina (*Rolfe*).—Flowers orange-red, small, disposed in a dense cluster; scape erect, 6in. high. Leaves erect, linear, 6in. long. Madagascar, 1893.

H. conopsea (*Benth.*).—Fragrant Habenaria. Flowers reddish or rarely white, small, very numerous, sweet-scented; lip three-lobed; spike oblong or cylindrical. All summer. Stem 1ft. to 2ft. high, with linear or narrow-lanceolate leaves. Tubers palmate. Europe (Britain), &c. Syns. *Gymnadenia conopsea* and *Orchis conopsea.*

H. decipiens (*Wight*).—Flowers 1½in. long, with a pendent spur 4in. to 5in. long; lip much longer than the green sepals, cuneate, three-lobed; pedicels long; scapes erect, few-flowered. September to November. Leaves radical, Plantain-like. Western Ghats of India, prior to 1891. Cool-house. Syn. *H. longecalcarata.* (B. M., t. 7228.)

H. Elwesii (*Hook.*).—Flowers greenish-yellow, 2in. long; petals bifurcate from the base; lip highly glabrous, the limb divided into three filiform segments; raceme lax-flowered. Nilghiri Hills, 1896. More curious than beautiful. (B. M., t. 7478.)

H. foliosa (*Rchb. f.*).—Flowers purple, numerous, in an ovate-oblong spike about 8in. long, produced in May; sepals erect, ovate, obtuse; petals similar but smaller and straighter; lip pendent, very large, three-lobed. Leaves unspotted, oblong; lower ones obtuse. (B. M., t. 5074; B. R., 1701.)

H. gigantea (*Don.*).—A synonym of *H. Susannæ.*

H. incisa (*Spreng.*).—Flowers rich purple, small, fragrant, thickly set in oblong, terminal racemes, borne in June. Leaves, cauline ones obtusely lanceolate, deep green. Introduced from North America, 1826.

H. longecalcarata (*A. Rich.*).—A synonym of *H. decipiens.*

H. macrantha (*Hochst*).—Sepals and petals dark brown; lip purplish-lilac, marked with darker streaks and freckles, roundish; spike six- to ten-flowered. Leaves sheathing, three-nerved. Abyssinia, 1886. Stove. Syn. *Gymnadenia macrantha.*

H. militaris (*Rchb. f.*).—A synonym of *H. pusilla.*

Habenaria.

H. pusilla (*Rchb. f.*).—Lateral sepals green, oblong, acute, reflexed and revolute; petals green, strongly adhering to the green dorsal sepal, forming a cucullate navicular helmet: lip scarlet, the side lobes oblong-dolabriform, spreading, the front lobe bifid; raceme lax. Leaves linear, acute, 8in. to 9in. long, ½in. broad. Height 1ft. or more. Cochin China, 1886. Stove. Syn. *H. militaris.* (Fig. 81; Gn., 1893, xliii., t. 908; J. H., 1888, xvi., p. 25; W. O. A., vi., 281.)

H. subpubens (*A. Rich.*).—Flowers white; sepals ovate-acute, nearly equal, dorsal one horizontal; petals undivided, galeate, obtuse; lip entire, ensiform; spur pendulous, two-lobed at apex. S. India. Syn. *H. candida.*

H. Susannæ (*R. Br.*).—Flowers pure white, the front lobe of the lip heavily fringed. This is the largest species of the genus. India and China. Syn. *H. gigantea.* (Fig. 81.)

HÆMARIA.

Formerly the plants contained in this genus, founded by Lindley, were known under the name of *Anœctochilus.* The species are terrestrial Orchids, of the tribe *Neotticæ*, and are natives of China, Cochin China, and the Malayan Archipelago. They are dwarf stove subjects, grown for their lovely foliage. The name is from the Greek *haima*, blood, and is in allusion to the colour of the under surface of the leaves. Sepals free; dorsal one erect, connivent or coherent with the petals in a hood; lateral ones spreading; lip affixed to the base of the column. The cultural requirements are similar to those recommended for *Anœctochilus*, though the culture of the plants has been successfully undertaken on the Continent without the aid of glasses.

HARTWEGIA.

This genus, founded by Lindley, and named after the well-known botanical collector, Theodor Hartweg, consists of about a couple of species of intermediate-house epiphytal Orchids, of the tribe *Epidendreæ*, and natives of Central America. *H. purpurea* (*Lindl.*) is probably the only species in cultivation, and this is rarely met with outside botanic collections.

HELCIA (*Lindl.*). This is now included under **Trichopilia.**

HERMINIUM.

Under the above name, given by Linnæus, are to be found a few species of curious and interesting Orchids belonging to the tribe *Ophrydeæ*, all natives of the temperate or alpine regions of Europe and Asia, closely allied to *Orchis*; but the perianth has no spur, and the anther-cells are distant at their base, the glands of the stalks of the pollen-masses protruding below the cells. The generic name, from *hermin*, the foot of a bed, is in allusion to the knob-like roots. Popularly, these plants are known as Musk Orchis. *H. monorchis* (*Lindl.*), the commonest and most widely spread species, is best grown on chalky banks. *H. alpinum* (*Lindl.*) is also found in botanic collections.

HEXADESMIA.

Four or five species of warm intermediate-house epiphytal Orchids, of the tribe *Epidendreæ*, are included in the above-named genus, established by Brongniart. They are natives of Mexico, Central America, the West Indies, and Brazil. Flowers small, fascicled or racemose. Leaves fleshy. The species that have been introduced are rarely met with except in botanic collections. The generic name is from *hex*, six, *a*, without, and *desmos*, a thong, and is in reference to the six separated pollen-masses.

HEXISIA.

Of the four or five species of epiphytal Orchids that comprise the genus *Hexisia (Lindl.)*, of the tribe *Epidendreæ*, only one has been introduced. All are natives of tropical America. The generic name, from *exisoein*, to be like, has reference to the conformity of the lip with the sepals. Flowers mediocre; sepals nearly equal, narrow, the dorsal one free, the lateral ones produced in a very short chin; petals resembling the dorsal sepal; lip erect, connate with the column at the base, the lateral lobes obscure, the

Hexisia.

middle one lanceolate, spreading, equalling the sepals; racemes terminal, few-flowered; peduncles short, leaves narrow, rather rigid. *H. bidentata* is the only species known in gardens, and this requires the same cultural treatment as *Ornithidium.*

H. bidentata (*Lindl.*).—In this species the bright scarlet flowers are borne in short racemes arising from the nodes; sepals and petals linear, acute; lip narrow, obovate-oblong. Leaves linear-oblong, not longer than the joints. Stems jointed, constricted at the nodes. Panama, Colombia, 1888. (B. M., t. 7031.)

HOLOTHRIX.

About eighteen species of stove or greenhouse, terrestrial Orchids, of the tribe *Ophrydeæ*, go to make up the genus *Holothrix* (*Rich.*). The species are natives of tropical and South Africa and Madagascar. The name is from *holos*, whole, and *thrix*, hair; the stems being hairy. Flowers small, in slender, usually secund spikes; sepals sometimes hairy; petals entire, or variously divided at the apex; lip erect or spreading, divided at the apex into from three to many segments, produced at the base into a spur; scapes slender, usually hairy, and without sheaths. Leaves one or two, sessile, ovate or orbicular-reniform, radical. The two species in cultivation are rarely seen outside botanic collections, and require warm intermediate-house treatment.

H. Lindleyana (*Rchb. f.*).—This pretty little species bears small white flowers in racemes; the lip is five-lobed, and has an inrolled spur; the scape is slender. The leaves are ovate, and spreading on the ground. South Africa, 1888. (G. C., 1888, iii., 365, fig. 56.)

HOULLETIA.

An epiphytal genus, of the tribe *Vandeæ*, founded by Brongniart, and related to *Stanhopea.* It is named in compliment to the French gardener, M. Houllet. About six species have been introduced, all from South America. They have short, conical, clustering pseudo-bulbs, bearing one large, plaited leaf, with a petiole of rather unusual length. The flower-scapes are tall and erect, producing

Houlletia.

large and finely-marked flowers, with spreading sepals and petals. The lip is united to the column, and is of very remarkable structure; it is divided into two parts, the basal one of which is furnished at each side with a curving, horn-like process almost the length of the column. The apical part is broader and articulated, and often develops two short, pointed lobes at the base.

Culture.—Although of such distinct and ornamental character, Houlletias are not common in gardens: nevertheless, when in flower, few Orchids are more effective. They may be grown along with the Cattleyas, where they should be shaded from bright sun, and the atmosphere about them be kept moist. They may be planted in pans of fibrous peat and sphagnum. Liberal supplies of water should be given when they are making their growth, only sufficient being afforded during the resting period to keep the pseudo-bulbs in a plump state.

H. Brocklehurstiana (*Lindl.*).—One of the best of the genus, with very distinct and showily-coloured flowers. The stout, ovate pseudo-bulbs are about 3in. high, deeply furrowed, and tapering towards the top; they each bear a solitary, pale green leaf, 1ft. to 1½ft. in length, broadly lance-shaped and plaited. The flower-stems originate at the base of the pseudo-bulbs, are about 2ft. long, and bear from ten to twelve flowers. The oblong sepals and petals are concave, usually of a rich reddish-brown, thickly marked with spots of a purplish tinge. The basal part of the lip is yellow, freely spotted with purplish-brown, and has two pointed, recurving horns at the sides; the somewhat triangular terminal lobe is almost entirely purple. In some forms the colour is much darker, and in others the ground-colour of the lip is nearly white, striped and spotted with purple. A native of Brazil; introduced in 1841. Syn. *Maxillaria Brocklehurstiana.* (B. M., t. 4072.)

H. Landsbergi (*Rchb. f.*).—Though described as long ago as 1855, this species has only been re-introduced within recent years. The flowers are large, fleshy, and 3in. across; sepals oblong, orange, with red spots; petals smaller, and notched; lip narrow, with four horn-like lobes, white, tinged with purple. Leaves 1ft. long, and 4in. broad. Pseudo-bulbs, 1in. long. Costa Rica, 1891. (B. M., t. 7362.)

H. odoratissima (*Lindl.*).—A handsome-flowered species, having ovate pseudo-bulbs, light green, lance-shaped, plaited leaves, and erect flower-scapes from 1ft. to 1½ft. high. There

are about six flowers on each scape, and each flower is 3in. across; sepals and petals oblong, pale purplish-red, with lines of a deeper colour; column and lip white, with a pair of reddish horns at the base; odour powerful and violet-like. Colombia, 1851.

Var. *antioquensis* has broader sepals and petals, and is coloured a rich reddish-crimson, the outside being brown. It is an improvement on the type.

Var. *xanthina* has sepals and petals orange-yellow, and a white lip tipped with yellow.

H. picta (*Linden* and *Rchb. f.*).—This very handsome Orchid has furrowed pseudo-bulbs 3in. high by 1in. broad at the base, tapering towards the top, and bearing a broadly lance-shaped leaf, that measures 1½ft. in length, and narrows at the base into a distinct stalk 2in. to 3in. long. The flowers are 3½in. in diameter, and are produced on a stem that springs from the base of the pseudo-bulb, and attains a height of 1½ft.; vigorous plants will develop nine or ten flowers on a spike. The sepals are narrowly oblong, with rounded tips, and, together with the petals (which are much narrowed at the lower half), are cinnamon-coloured, the basal portion of each being tessellated with yellow. The terminal division of the lip is yellow, marked with transverse bars of reddish-purple, spear-shaped, with a recurving, channelled apex; the inner lobe is yellow, spotted with crimson-purple, smaller and somewhat trapeziform, and is furnished at the sides with two ascending spurs. The length of the whole lip is 1½in. A native of Colombia. (B. M., t. 6305.)

HUNTLEYA (*Batem.*). This is now included under **Zygopetalum.**

IONOPSIS.

Very pretty little epiphytal Orchids, belonging to the tribe *Vandeæ*. The genus was established by Humboldt, Bonpland, and Kunth, and the name is from *ion*, a violet, and *opsis*, like, in allusion to the Violet-like flowers. About ten species have been described, natives of the West Indies and tropical America, but by many the majority of these are regarded as varieties of two species. Flowers small, panicled; sepals and petals connivent; lip large, fan-shaped, two-lobed at the apex. Leaves few, lanceolate. Stems very short. The species most seen in cultivation is *I. paniculata*. It is best accommodated in a basket or a

Ionopsis.

shallow pan, provided with ample drainage, and a compost consisting wholly of sphagnum and partly-decayed leaves. It must never be allowed to suffer from want of moisture at any season of the year.

I. paniculata (*Lindl.*).—This is a very variable species producing an abundance of its delicate flowers in spreading panicles. Sepals and petals very short, sharp-pointed; lip very large, two-lobed, the limb being sometimes white, and at others either purple- or yellow-spotted. Winter. Leaves linear lanceolate, thick and channelled, keeled, 6in. long. (B. M., t. 5541.)

IPSEA.

Two species of intermediate-house terrestrial Orchids of the tribe *Epidendreæ*, make up the genus *Ipsea* (*Lindl.*).



FIG. 82. FLOWER OF IPSEA SPECIOSA (nat. size).

The name is from *ips*, a Cynips insect, which the flowers are thought to resemble. The species are natives of

Ipsea.

India and Africa, and have long, narrow, plicate leaves, and the sheathed scape of *Pachystoma* (under which genus *Ipsea* was included by Bentham and Hooker), but are distinctly pseudo-bulbous, with a few large, highly-coloured flowers.

I. speciosa, the only species in cultivation, is best suited when grown in well-drained pans or shallow baskets containing equal portions of fibrous peat, leaf soil, and sphagnum, with a liberal sprinkling of rough sand or broken crocks. It requires a liberal supply of root moisture while in an active state; as soon as growth has matured it requires to be suspended in a light position of the house.

I. speciosa (*Lindl.*).—Flowers yellow, showy, usually solitary, sometimes twin, very sweetly scented; sepals nearly 2in. long, oblong, lateral ones connate with the base of the column; petals slightly narrower, obtuse; middle segment of the lip oblong, obtuse, lateral ones broad, acute; scape purple, 1ft. to 1½ft. high. Leaves twin, sheathing at the base, narrow, ensiform. Roots succulent. Spring. Ceylon. Syn. *Pachystoma speciosum.* (Fig. 82; B. M., t. 5701.)

ISABELIA.

A monotypic genus of the tribe *Vandeæ*, and founded by Rodriguez. The generic name is a complimentary one to H.I.H. Isabel, Comtesse d'Eu, a great patroness of Horticulture. The species *I. virginalis* has solitary, white flowers, and very peculiar creeping, single-leaved, pseudo-bulbs. It is an epiphyte and a native of Brazil. Warm intermediate-house treatment is called for.

ISOCHILUS.

Though four or five species of the above-named genus of the tribe *Epidendreæ* have been described, but one, *I. linearis*, is met with. Robert Brown established the genus, which derives its name from *isos*, equal, and *cheilos*, a lip; in allusion to the shape of the labellum. The species are natives of the West Indies and tropical America. Flowers rose or red, in one row, in spike-like racemes, small or medium; lip free from the column,

Isochilus.

contracted at the base with a slight S-like curvature. Stems bearing the leaves in two rows. *I. linearis* requires warm intermediate-house treatment.

I. linearis (*R. Br.*).—The flowers are purple, borne in short spikes, and are produced in spring. Leaves linear, distichous, striate, obtuse, emarginate. Stems slender, tufted. Tropical America. (B. R., t. 745.)

KEFERSTEINIA (*Rchb. f.*). This is now included under **Zygopetalum.**

LACÆNA.

Two species of epiphytal Orchids, of the tribe *Vandeæ*, form this genus, which was founded by Lindley. The generic name is supposed to mean native of Lacedæmon; it is one of the names of Helen of Troy. As, however, this would imply great beauty, the name cannot be said to be well bestowed. The species are natives of Central America. They are best accommodated in baskets or pans, and treated like *Lycaste* and *Anguloa*, to which genera they are closely allied.

L. spectabilis (*Lindl.*).—Flowers pinkish-white, dotted with purple, produced in May in loose pendulous spikes; sepals concave orbicular; petals smaller and connivent; lip three-lobed, the central one prolonged into a stalked spade-shaped body, thickly dotted. Leaves elliptic. Height 6in. Pseudo-bulbs oblong. 1853. Syn. *Acineta Wrightii.* (B. M., t. 6516.)

LÆLIA.

In the introductory notes on the genus *Cattleya*, reference was made to the nearness of the relationship between that genus and *Lælia* (*Lindl.*). The latter is separated into two groups, viz.: (1) all those species which are natives of Mexico and Guatemala, including *albida*, *anceps*, *autumnalis*, *furfuracea*, *majalis*, *rubescens*, and *superbiens*; (2) those kinds which are similar in habit and flowers to the Cattleyas, and of which *Boothiana (lobata)*, *crispa*, *Dormaniana*, *elegans*, and *Perrinii*, are examples. The genus, which is a very showy one, belongs to the tribe *Epidendreæ*, and the name it bears is that of a vestal

Lælia.

virgin, its flowers being so delicately beautiful. The species inhabit the warmer parts of America, from Brazil to Mexico.

Culture.—The cultural requirements of the second group are practically the same as recommended for Cattleyas generally. The first group, however, is rather more difficult to manage. The plants should be placed in well-drained pans, or in teak-wood baskets, and suspended near the roof-glass of the house. Very little compost is required, a small quantity of peat-fibre, mixed with sphagnum, being sufficient. The temperature during the growing season should be from 60deg. to 65deg. by day, and from 53deg. to 60deg. by night; but during bright, warm weather it may be allowed to run up much higher than this, if only plenty of air and moisture be supplied. The plants should be examined for water twice daily in hot weather, and freely syringed overhead. They require little shading at any time. The plants must have every encouragement until the flowers have expanded. After the flowers have been removed, less water is needed; and, finally, when the new pseudo-bulbs are plump and ripe, water should be altogether withheld, and the temperature be kept low, only sufficient fire heat being necessary to exclude frost. Some growers place such species as *majalis* and *furfuracea* outside and expose them to full sunshine during August and September. If, however, *majalis* is grown in a vinery, suspended in a basket, there is little difficulty in inducing it to flower satisfactorily. A peach-house will also answer the purpose equally well.

L. acuminata (*Lindl.*).—A synonym of *L. rubescens.*

L. albida (*Batem.*).—A very elegant species, with oblong or pear-shaped pseudo-bulbs, bearing usually two strap-shaped, coriaceous, dark green leaves, about 6in. long. The scape is 1½ft. or more high, and bears from three to six flowers, which are not large, but very fragrant and graceful; the sepals and petals are white, tinted with rose; the lip also is white, or pale pink, streaked in the centre with lines of yellow; the middle lobe is curled back. A native of the mountains of Mexico, whence it was introduced about 1832. It is frequently imported in large quantities, and is usually cheap. It flowers in November and December. (B. M., t. 3957.)

Var. *bella.*—Flowers flushed with rose; lip bright rose.

Lælia.

Var. *Stobartiana.*—Ends of sepals, petals, and lip, coloured bright purple.

Var. *sulphurea.*—Flowers pale sulphur-yellow.

L. anceps (*Lindl.*).—A larger-growing plant than *L. albida.* The pseudo-bulbs are ovate and somewhat compressed. The leaves are solitary, rarely in pairs, broadly lance-shaped, shining green. The scape is 2ft. to 3ft. long, flattened, jointed, and bears from three to six flowers, 4in. across; the sepals and petals are nearly equal, lance-shaped, and purplish-rose, or rosy-lilac; the lip is funnel-shaped below, with a tongue-like front lobe, the colour being deep purple, shaded with rose, yellow in the throat, with purple streaks. There are many varieties of this species; they vary chiefly in the intensity of colour or the numbers of the flowers that are borne upon the scape, but all are beautiful. *L. anceps* will thrive under block- or basket-culture. It blossoms during the months of December and January, at which time it is the most beautiful of all Orchids. Large specimens of it are remarkably handsome, producing as many as twenty scapes or more of fragrant flowers, to the rich hues of which no artist can do justice. It is a native of Guatemala and Mexico, and first flowered in this country in 1834. (B. M., t. 3804.)

The varieties of this species are now very numerous, and it is difficult to do justice to it by enumerating less than the subjoined forms, which are still far from being complete. Good forms are rare, and are not to be procured readily. They are grown in quantity in a few collections only, owing to the fact that the blooms are delicate, and that they are readily injured by fog and dull atmospheric conditions.

Var. *alba.*—Flowers absolutely pure white, save for a little lemon-yellow in the tube. This form has only once been reintroduced since it was shown by Mr. Bull in 1878. It is usually known as Bull's *alba.* Mr. Worthington, of Whalley Range, secured a plant in Mexico in 1893.

Var. *Amesiana.*—Sepals and petals white at base, deepening to light purple at tips; blade of the lip deep ruby-purple; petals very broad.

Var. *Amesiana Crawshayana.*—This is the finest form yet Certificated by the R. H. S., the purple of the sepals and petals being very dark indeed; the lip is a deep velvety-maroon purple.

Var. *Ashworthiana.*—Sepals and petals pure white, of very fine form; lip having a pure white anterior lobe, marked by a few small spots of slaty-blue, and having similarly coloured lines in the tube.

Lælia.

Var. *Ballantineana.*—This variety is scarcely distinguishable from *L. Amesiana Crawshayana.*

Var. *Barkeriana.*—The first named variety, introduced in 1836, was narrow, and of a uniform dark colour. Many of the later named varieties are properly referable to this as a colour-type, but are so far superior as to merit individuality.

Var. *blanda.*—Sepals and petals soft pale rose; lip deep amethyst-purple.

Var. *Chamberlainiana.*—This and the succeeding variety are the largest two known. Sepals and petals rosy-purple; lip deep purple. The form of the flowers is superb.

Var. *Crawshayana.*—Similar to the preceding, but a little squarer in the shoulders of the petals and a little smaller in the lip.

Var. *Dawsoni.*—Whole flower pure white, save for a deep crimson blotch on the anterior lobe, with rose spots sometimes on the side lobes; the lines in the tube are similarly coloured. This is generally acknowledged to be the best of the white forms with colour on the lip.

Var. *Hardyana.*—A very dark variety of almost uniform tint.

Var. *Hilliana.*—Sepals and petals pure white, of rather narrow form; lip having pale rose anterior and side lobes.

Var. *Hilliana rosefieldiensis.*—Similar in colour to the preceding, but greatly in advance in form in every part of the flower.

Var. *Hollidayana.*—This is rather generally identified by many as *Stella* and *Sanderiana*, but it is distinguishable from those varieties by its better form, being altogether more compact, and rounder in both flower and bulb. It is very often mistaken for *Dawsoni.* It is very variable in its lip, the anterior lobe being pure white, as well as having a deep crimson blotch as in the originally-named form. The sepals and petals are pure white, while the lines in the tube are smaller than in the *Sanderiana* section.

Var. *Hollidayana Crawshayana.*—This is the finest form. The flowers are of great substance and grand shape; lip very large, having the veins on the anterior lobe delicately pencilled with mauvish-purple, and having very heavy lines in the tube.

Var. *Leeana.*—A pure white variety, having faint rose on the anterior and side lobes.

Var. *Mrs. De B. Crawshay.*—One of the darkest varieties known. Of an intense shining deep purple, with a large lip, almost as deep as in *Amesiana Crawshayana.*

Var. *Oweniana.*—As originally shown, this variety had sepals and petals more or less marbled with white on a rose-purple ground.

Lælia.

Var. *Percivaliana.*—Sepals and petals palest rose-pink, white at the bases; lip having all three lobes tipped bright mauve-purple around a white discal area.

Var. *Sanderiana.*—Sepals and petals pure white; lip having a crimson blotch on the anterior lobe, with crimson lines in the tube. (Fig. 83.)



FIG. 83. LÆLIA ANCEPS SANDERIANA
(much reduced).

Var. *Schrœderæ.*—This is the first of the section, and generally called the "*Amesiana.*" The form of the flower, though small, is superb. The colours are similar to those in *Amesiana Crawshayana*, but if anything a little more pronounced.

Lælia.

Var. *Schrœderiana.*—Flower pure white, save for the crimson lines in the tube. The form is grand, and like *Dawsoni* in the best varieties. The anterior lobe of the lip is very large and oblong, and the junctions of it and the side lobes overlap, thereby differing from any other *anceps* variety.

Var. *Stella.*—This is of the same description as *Sanderiana*, except that the lip is pure white, having only the crimson lines in the tube. As these two varieties grow together it happens that many plants are "tinted-lipped Stellas" and "pale-lipped Sanderianas," but *Stella* is larger and finer in the petals.

Var. *Veitchiana.*—Sepals and petals almost pure white; the anterior lobe of the lip is deep slaty-blue, with similar lines in the tube.

Var. *waddonensis.*—This can best be described as a very grandly formed *Hollidayana*, with a pure white lip, like *Schrœderiana* (without the overlap at the junctions), and with two very pale slaty-blue lines on each side of the keel. It is as large but of not quite the same form as *Schrœderiana.* (Fig. 84.)

Var. *Williamsiana.*—Whole flower pure white, except for the lines in the tube, which are extremely deep brown-purple, and when freshly open appear almost black. In form it is narrower than *Stella*, for which it is often mistaken.

L. autumnalis (*Lindl.*).—Although to some extent resembling *L. anceps*, this species is abundantly distinct. The pseudo-bulbs are ovate, ribbed, tapering to the apex, 6in. long, and bear two, or sometimes three, leaves, which are lance-shaped, 6in. long, and bright green. The scape is 2ft. or more high, rather stout, three- to six-flowered; the sepals and petals are oblong-lanceolate, waved at the edges, both being of a beautiful rose-purple; the lip is three-lobed, rosy-white, with a yellow centre and purple apex. This and its varieties take rank with the most select of all Lælias. They grow and flower freely under the treatment advised for the Mexican species. The fragrant and lasting flowers are of exceptional value owing to their expanding in October and November. In Mexico this Orchid is known as the "All Saints' Flower." Introduced in 1836. (B. M., t. 3817.)

Var. *alba* has pure white flowers.

Var. *atrorubens.*—Flowers very large, deep crimson, paler towards the centre.

L. Boothiana (*Rchb. f.*).—A robust plant. Pseudo-bulbs spindle-shaped, compressed, about 6in. long, one-leaved. Leaf 8in. to 10in. long, leathery. Scapes two- to five-flowered; flowers 5in. across; sepals narrow, with reflexed margins; petals broad,

Lælia.

wavy, with crisped margins; lip folding at the sides, spreading and curved in front, wavy at the margin, and coloured rich purple, with lilac veins, the rest of the flower being rosy-lilac. A handsome-flowered kind, thriving under the treatment recommended for Cattleyas, with the addition of all the sunlight possible all the year round, otherwise the flowers are apt to fail.

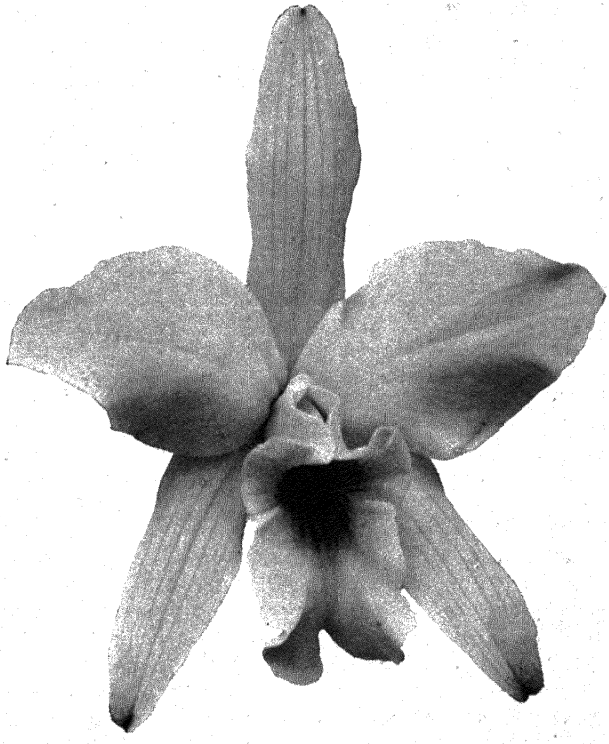


FIG. 84. FLOWER OF LÆLIA ANCEPS WADDONENSIS
(⅔ nat. size).

It blossoms in April and May. Introduced in 1847 from Rio de Janeiro, where it grows high upon bare rocks that are washed by the ocean below, and where it is fully exposed to the sun from morning till night. Syns. *L. lobata* and *Cattleya lobata.* (Rev. Hort., 1874, p. 33.)

Lælia.

L. cinnabarina (*Batem.*).—A graceful Orchid, in which the pseudo-bulbs are narrow, swollen at the base, or flask-shaped, dark green, 6in. to 10in. long, bearing usually a single erect, dark green leaf of the same length. The scape is erect, 15in. to 20in. long, and many-flowered; the sepals and petals are narrow, and, as well as the lip, of a deep red-orange colour, to which the species owes its name. Each flower is about 2½in across. Pot-culture suits this species best. It blossoms during spring and early summer, the flowers lasting about six weeks. It is a most ornamental plant, and is easily grown and flowered under ordinary Cattleya treatment. Brazil, 1836. (B. M., t. 4302.)

L. crispa (*Rchb. f.*).—An old, easily-grown, ornamental species, interesting on account of its being one of the parents of some of the best garden hybrids. It has stout, clavate pseudo-bulbs, from 7in. to 10in. long, flattened, furrowed, and one-leaved. The leaf is stout, 1ft. long, rounded at the apex. The spike bears from four to seven flowers, which are about 5in. across; sepals white, lanceolate, 3in. long; petals broader, white, wavy and crisped along the margins; lip three-lobed, the side lobes folding over the column, white outside, yellow and purple inside, and the front lobe oblong, wavy, pointed, and coloured amethyst-purple, with veins of a deeper shade; there is also a blotch of purple in the throat. This species was one of the first introduced, having been cultivated at Chiswick in 1826, whither it was sent from Rio de Janeiro by Sir Henry Chamberlain. It blossoms in early autumn. Syn. *Cattleya crispa.* (B. M., t. 3912.)

L. Dayana (*Rchb. f.*).—A variety of *L. pumila.*

L. Digbyana (*Benth.*).—This remarkable plant was until recently known as *Brassavola Digbyana.* It has short, compressed, sheathed, one leaved pseudo-bulbs, and thick, fleshy, grey-green leaves, 6in. long. Flowers borne singly on each pseudo-bulb, 5in. across; sepals and petals equal, narrow, pale yellow; lip heart-shaped, the sides folding, the margin fimbriated, colour cream-white. The flowers are produced in July and August. When growing, this plant should be placed near the roof-glass in a stove, and be ripened and rested in an intermediate-house. Introduced from Honduras in 1846. *L. Digbyana* has proved one of the most useful parents for hybridisation purposes. Its offspring are much sought after at the present time. (Fig. 85; B. M., t. 4474.)

L. Dormaniana (*Rchb. f.*).—A small species, the pseudo-bulbs being no thicker than a goose-quill, about 9in. high, the base swollen. Leaves two or three, about 4in. long. Flowers in

spikes of three or more, each 3in. across; sepals and petals similar, narrow, olive-brown, veined with purple; side lobes of lip pale purple, the front lobe short, deep purple. A dusky-flowered little plant, which was introduced from Brazil in 1879. It requires ordinary Cattleya treatment, and flowers in spring. By some botanists this is known as *Cattleya Dormaniana.*

L. elegans (*Rchb. f.*). A synonym of *Lælio-Cattleya elegans.*

L. flava (*Lindl.*).—A rare and pretty species, with cylindrical pseudo-bulbs, similar to *L. cinnabarina* in general habit, but

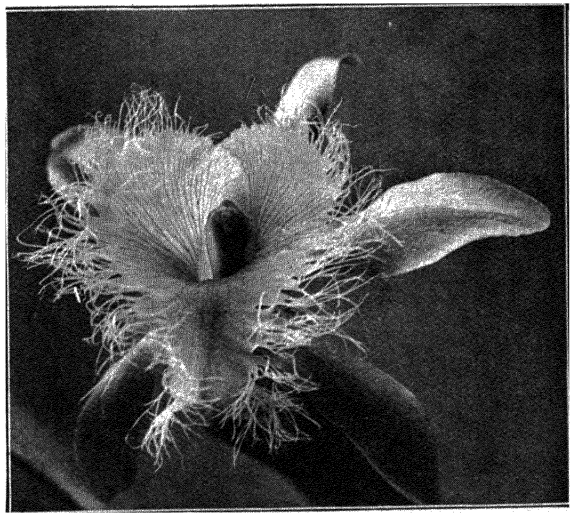


FIG. 85.—FLOWER OF LÆLIA DIGBYANA (much reduced).

usually shorter. Peduncles erect, 1ft. to 1½ft. long, three- to nine-flowered; sepals and petals similar, lance-shaped, and falcate; lip narrow, recurved, and crisped at the edge; the colour of the whole flower is a uniform golden-yellow. Introduced from Brazil in 1839. Its cultural requirements are similar to those for Cattleyas. The flowers are developed in late autumn. (B. R., 1842, t. 62.)

L. furfuracea (*Lindl.*).—Pseudo-bulbs and habit as in *L. autumnalis*, but smaller. Peduncles 6in. long, bearing one, two, or three flowers, each being 5in. across; petals broader

Lælia.

than the sepals, pale purple; side lobes of lip rounded; front lobe oblong, bright purple. This is not easily kept in health, rarely lasting more than four years under cultivation. Being a native of Oaxaca, in Mexico, it requires the treatment recommended above for the Mexican species. It flowers in autumn. Introduced in 1838. (B. M., t. 3810.)

L. grandis (*Lindl.*).—A remarkable species, and one that is rarely met with. Pseudo-bulbs as in *Cattleya*, one-leaved, the leaf 8in. to 10in. long. Peduncles erect, three- to five-flowered; flowers 4in. across; petals broader than the sepals, both wavy and spreading, and coloured tawny-yellow; lip tube-shaped at base, white on the sides, the front lobe rounded, white, veined with purple. Introduced from Brazil in 1849. The cultural requirements of this species can only be supplied in a hot, moist stove during the growing season (May to August), and in an intermediate-house for the resting season. The flowers are produced in spring. (B. M., t. 5553.)

L. harpophylla (*Rchb. f.*).—In this distinct plant the pseudo-bulbs are very slender, tufted, erect, 1ft. or more high, and one-leaved. Leaf narrow, pointed, 6in. to 8in. long. Peduncles from four- to seven-flowered; flowers about 3in. across; sepals and petals equal, narrow, spreading, star-like; lip small, the sides folding, the front curling right back, and crisped on the margin; colour of the whole flower a bright cinnabar-red, with a whitish margin to the lip. The blossoms are produced in April and May. This is an easily-managed plant, as it grows freely in a warm greenhouse, and rarely fails to flower profusely. It is one of the brightest and most attractive of all Orchids when in blossom. Introduced from Bahia in 1865, and not again till about 1883.

L. Jongheana (*Rchb. f.*). — A distinct, pretty species. Pseudo-bulbs egg-shaped, compressed, 2in. long, one-leaved. Leaf 4in. long, erect. Peduncle as long as the leaves, one-flowered; flowers 5in. across, flat, rose-purple; petals broader than the sepals, lance-shaped; lip oblong, with triangular side lobes, the front lobe rounded, the margin crisped, yellow and white in the throat. Flowering season, March or April. Introduced from Brazil in 1854. (B. M., t. 6038.)

L. lobata (*Veitch*).—A synonym of *L. Boothiana.*

L. majalis (*Lindl.*).—A dwarf-growing plant, succeeding best when grown upon a block; it ranks amongst the most beautiful of the genus, and is called in its native country "Flor de Majo," or May Flower, in allusion to its season of flowering. The pseudo-bulbs are clustered, egg-shaped, pale green, wrinkled when

old, bearing usually a single leaf, 6in. long. The scape bears a single large flower, 6in. across; the sepals are lance-shaped; the petals are broad, soft rose in colour; the lip is very large, rose-lilac, streaked and dotted with purple. It blossoms during the early summer, but is somewhat difficult to flower. It was discovered and roughly figured by Hernandez as long ago as 1615; he gives its native name as "Chichilitic Tepetlavhxochitl"! For cultural details, see the introductory matter to the genus. Mexico, about 1838. (Fig. 86; B. M., t. 5667.)

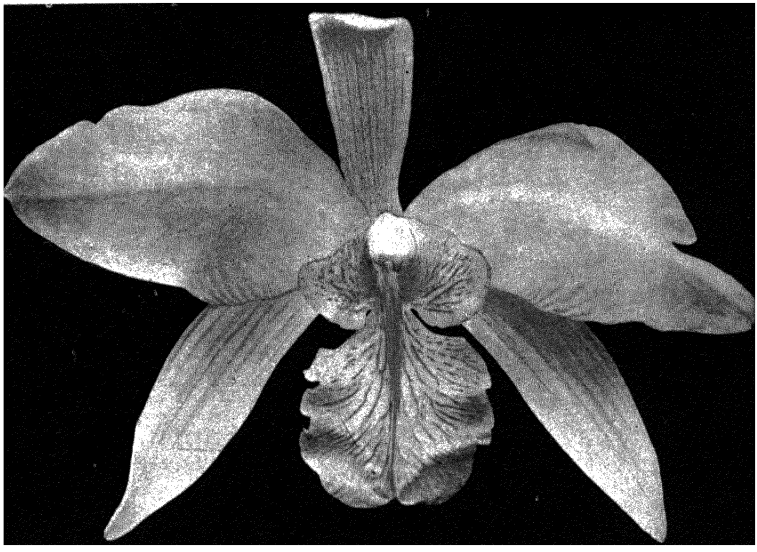


FIG. 86. FLOWER OF LÆLIA MAJALIS (much reduced).

L. monophylla (*N. E. Br.*).—The smallest of all Lælias, the whole plant being scarcely 6in. high, and the flowers less than 2in. across. Nevertheless it is a charming little Orchid. The pseudo-bulbs are scarcely thicker than a knitting-needle, 3in. to 5in. long. Leaves 2in. long. Scape as long as the leaf, one-flowered; flower vivid orange-scarlet, with a purple, eye-like anther-cap; sepals and petals similar; lip very small. Known in a wild state only in Jamaica, at an elevation of 5000ft., whence it was introduced to Kew, and flowered in

Lælia.

1882. It thrives best when planted in a small pan, and suspended near the glass with the Odontoglossums, or in an ordinary cool intermediate-house. It blossoms in autumn. (B. M., t. 6683.)

L. peduncularis (*Lindl.*).—A synonym of *L. rubescens.*

L. Perrinii (*Lindl.*).—An elegant, autumn-flowering species. The pseudo-bulbs are stout, 6in. to 9in. high, compressed, and bear each a single dark green leaf of the same length. The scape is erect, bearing from three to six flowers, which are 5in. across and curiously flattened; the sepals and petals are rosy-purple, tipped with purplish-magenta, and the lip is. pale purple on the small side lobes; the front lobe is reflexed, pointed, rich purple, with a yellow blotch in the throat. Brazil. (B. M., t. 3711.)

Var. *nivea* (sometimes called *alba*).—Flowers white, slightly tinged with yellow on the disk of the lip.

L. præstans (*Rchb. f.*).—A variety of *L. pumila*, but by some regarded as of specific rank.

L. pumila (*Rchb. f.*).—A dwarf, compact-growing species. Pseudo-bulbs thin, round, 2in. to 3in. long, one-leaved. Leaf oblong, the same length as the pseudo-bulbs. Peduncles short, one-flowered; flowers 4in. across; sepals lance-shaped; petals ovate, 1in. broad; lip folding over at the sides, spreading in front, where it is 1in. across; colour of whole flower rose-purple; front of lip maroon-purple, paler in the centre of the middle lobe; throat with three to five parallel ridges. The flowers are developed in September or October, and remain good two weeks or more. Introduced from Brazil in 1838. Syns. *Cattleya marginata*, and *C. Pinelii*. (B. M., t. 3656.) This species should be cultivated in shallow pans or teak baskets, which should be partly filled with drainage, the remainder consisting of peat-fibre and a little sphagnum. During the growing season the plants should have plenty of water, and at all times the compost should be kept moist. The best position is near the roof-glass in a warm, moist, intermediate-house.

Var. *Dayana* has a dark purplish border, and darker veins.

Var. *præstans* has larger and more highly coloured flowers, and broader sepals and petals. (B. M., t. 5498.)

L. purpurata (*Lindl.*).—One of the grandest Lælias in cultivation. It is a robust-growing plant, producing large, spindle-shaped, compressed pseudo-bulbs, each bearing a broad, leathery, dark green leaf 1ft. or more long. The scape is erect, and from three- to seven-flowered; the flowers are very large, sometimes

as much as 8in. in diameter, the sepals and petals being narrow at the base, broader in the upper half, white, tinted and streaked with rose-purple; the lip is also very large, sometimes as much as 3in. in length, broad, and spreading in front, the margin being crisped; the colour is rich purple, veined with a deeper shade, the throat being pale yellow, with purple lines. The plant flowers during the spring and early summer, and is a native of Southern Brazil. (P. F. G., iii., 96.)

Var. *Brysiana.*—Sepals and petals tinged with rose-lilac; lip deep purple.

Var. *Russelliana.*—Sepals and petals white, tinted with lilac; lip rose-lilac, with veins of purple.

Var. *Schrœderi.*—Sepals and petals white; front of lip mauve-purple, bordered with white.

L. rubescens (*Lindl.*).—A small plant, with compressed, ovoid pseudo-bulbs, 1in. to 2in. long, one-leaved. Leaf oblong, 4in. in length, leathery. Scape slender, 1ft. long, jointed, four- to seven-flowered; flowers 2½in. across, full; petals and sepals nearly equal, white or rose-lilac; lip short, with a rather large front lobe, which is lilac, with a blotch of purple in the throat. A native of Southern Mexico and Guatemala. Introduced in 1840. It flowers in November and December, and should be cultivated as advised for the Mexican species. Syns. *L. acuminata* and *L. pedunculatis*. (B. M., tt. 4099 and 4905).

Var. *alba.*—Flowers white, with a yellow blotch on lip.

Var. *rosea.*—Flowers mauve; lip blotched with maroon.

L. superbiens (*Lindl.*).—This fine, strong-growing species has pseudo-bulbs 1ft. or more long, and stout, bearing thick and leathery rather light green leaves as long as the pseudo-bulbs. The spike attains a height of about 5ft., bearing from ten to twenty flowers near the apex; these are 6in. across; the sepals and petals are similar, coloured rich rose, and tinged with lilac; the lip is deep crimson-purple, striped with yellow. This species blossoms during the winter months. It was introduced from Guatemala about 1840. Mr. G. Ure Skinner, who was the first to discover it, says he found it growing on rocks. Some of the plants had pseudo-bulbs 22in. long, and flower-stems 4yds. in length, bearing twenty flowers or more each. (B. M., t. 4090.)

L. tenebrosa (*Rolfe*).—A most distinct and easily-grown species. Sepals and petals coppery-bronze; lip purple, of a lighter shade at the margin, darker in the throat, and having a dark blotch on either side of the disk. Introduced from Bahia

in 1891. There are several named varieties the most prominent and distinct of these being the Walton Grange variety.

L. xanthina (*Lindl.*).—A second-rate species, with the habit of a *Cattleya Trianæi*, and flowers 3in. across, their colour being buff-yellow except the front of the lip, which is white, streaked with crimson-purple. A native of Brazil, whence it was introduced in 1858. (B. M., t. 5144.)

Lælias, like the closely-allied Cattleyas, have lent themselves readily to the skill of the hybridist, with the result that many charming plants have been produced. Appended is a list of all those recorded, with their parents, to date. Many of the hybrids that were originally described as Lælias have now been removed, and are classed under the name of *Lælio-Cattleya.*

GARDEN HYBRIDS.

amœna	*anceps* and *pumila* (Ingram).
Briseis	*harpophylla* and *purpurata* (Douglas).
cinna-brosa	*cinnabarina* and *tenebrosa* (Charlesworth).
Clarinda	*Perrinii* and *pumila* (Veitch).
Clio	*cinnabarina* and *glauca* (Veitch).
Cornet	*cinnabarina* and *harpophylla* (Charlesworth).
Diana	*Dayana* and *purpurata* (Keeling).
Digbyano-purpurata	*purpurata* and *Digbyana* (Veitch).
Edissa	*anceps* and *purpurata* (Veitch).
Euterpe	*Dayana* and *crispa* (Veitch).
Eveline	*tenebrosa* and *pumila* (Miller).
Exquisite	Syn. *juvenilis.*
flammea	*cinnabarina* and *Pilcheri* (Veitch).
gemma	Syn. *Euterpe.*
Gravesiæ	Syn. *Euterpe.*
Helen	*Digbyana* and *tenebrosa* (Maron).
Icarius	*flava* and *cinnabarina* (Veitch).
Iona	*tenebrosa* and *Dayana* (Charlesworth).
juvenilis	*Perrinii* and *pumila* (Bleu).
Latona	*cinnabarina* and *purpurata* (Veitch.)
Lucy Ingram	*purpurata* and *Perrinii* (Ingram).
Mozart	Syn. *lilacina* (nat. hyb.).
Mrs. M. Gratrix	*cinnabarina* and *Digbyana* (Veitch).
Nemesis	*anceps* and *superbiens* (Crawshay).
nigrescens	*pumila* and *tenebrosa* (Maron).
Olivia	*crispa* and *xanthina* (Veitch).
Omen	*autumnalis* and *purpurata* (Veitch).
Oweniana	*Dayana* and *xanthina* (Sander).
Pacavia	*purpurata* and *tenebrosa* (Veitch).
Pilcheri	Syn. *lilacina* (nat. hyb.).
pulcherrima	*Boothiana* and *purpurata* (Sander).
purpurato-grandis	*purpurata* and *grandis* (Mantin).
Ragotiana	*grandis* and *cinnabarina* (Ragot).
splendens	*crispa* and *purpurata* (Ingram).
Tula	Syn. *Latona.*

Lælia.

NATURAL HYBRIDS.

amanda	*crispa* and *Boothiana.*
Crawshayana	*autumnalis* and *albida.*
Eyermaniana	*majalis* and *albida.*
Finckeniana	*albida* and *anceps Sanderiana.*
Gouldiana	*autumnalis* and *anceps.*
Leeana	*pumila* and unrecorded.
leucoptera	*furfuracea* and *albida.*
lilacina	*crispa* and *Perrinii.*
Lindleyana	*See* **Brasso-Cattleya Lindleyana.**
porphyritis	*pumila* and *Dormaniana.*
venusta	*furfuracea* and *majalis.*
Wyattiana	*crispa* and *Boothiana.*

LÆLIO-CATTLEYA.

Rolfe's name for the bi-generic hybrids derived from the intercrossing of the two genera *Cattleya* and *Lælia.* The cultural requirements are the same as those recommended for Cattleyas.

HYBRIDS.

Acis	*L. tenebrosa* and *C. Mendellii* (Miller).
Ada	Syn. *Mardelli* (Leemann).
Admiral Dewey	*C. Warnerii* and *L.-C. Schilleriana* (Maron).
Adolphus	*L. cinnabarina* and *C. Aclandiæ* (Paynter .
Agnes	*L.-C. Schilleriana* and *L.-C. callistoglossa* (Keeling).
Alberti	*L. purpurata* and *C. velutina* (Linden).
Alcides	Syn. *Berthe Fournier.*
Amazone	*C. maxima* and *L. purpurata* (Ingram).
Amelia	*C. intermedia* and *L. cinnabarina* (Gratrix).
Amesiana	*C. maxima* and *L. crispa* (Veitch).
amœna	*C. Loddigesii* and *L. Perrinii* (Bleu).
Andreana	*C. bicolor* and *L.-C. Schilleriana* (Maron).
Antigone	Syn. *L.-C. purpurato-Schilleriana.*
Antimachus	*C. Warscewiczii* and *L.-C. Dominiana* (Leemann).
Aphrodite	*C. Mendellii* and *L. purpurata* (Lee).
Apollonia	*L. purpurata* and *C. Dowiana aurea* (Douglas).
Arnoldiana	Syn. *eximia.*
Arthuriana	*C. luteola* and *L. Dormaniana* (Dorman).
Ascania	*C. Trianæi* and *L. xanthina* (Veitch).
Aurora	*C. Loddigesii* and *L. Dayana* (Veitch).
Aylingii	Parentage unrecorded (Hollington).
Baroness Schröder	*C. Trianæi* and *L. Jongheana* (Baron Schrœder).
Behrensiana	*L.-C. Schilleriana* and *C. Loddigesii* (Sander).
belairensis	*L. autumnalis* and *C. Bowringiana* (Mantin).
bella	*L. purpurata* and *C. labiata vera* (Veitch).
Bertha	*L. grandis* and *C. Schrœderæ* (R. H. Measures).
Berthe Fournier	*L.-C. elegans* and *C. aurea* (Maron).
Bertie Warberton	Syn. *Canhamiana.*
blessensis	Syn. *Aurora.*
bletchleyensis	*L. tenebrosa* and *C. Warscewiczii* (Leon).
Borellii	Syn. *C. G. Roebling.*

Lælio-Cattleya.

Bowri-albida *C. Boweringiana* and *L. albida* (Orpet).
Bowringiano-blessensis *C. Boweringiana* and *L.-C. blessensis* (Maron).
broomfieldiensis Syn. *Ingramii*.
Bryan *C. Gaskelliana* and *L. crispa* (Cookson).
Brymeriana *L.-C. amanda* and *C. Warscewiczii* (Brymer).
callistoglossa *L. purpurata* and *C. Warscewiczii* (Veitch).
caloglossa *C. labiata vera* and *L. Boothiana* or *L. crispa* (Veitch).
Canhamiæ Syn. *Canhamiana*.
Canhamiana *L. purpurata* and *C. Mossiæ* (Veitch).
Cappei *L. cinnabarina* and *C. Warscewiczii* (Cappe).
Captain Law-Schofield Syn. *Canhamiana*.



FIG. 87. FLOWER OF LÆLIO-CATTLEYA DOMINIANA
(much reduced).

Captain Scott Syn. *Schutzeriana*.
Cassandra *C. Loddigesii* and *L.-C. elegans* (Veitch).
Cassiope *L. pumila* and *L.-C. exoniensis* (Veitch).
Ceres *C. Mossiæ* and *L.-C. Hippolyta* var. *Phœbe* (Peeters).
C. G. Roebling *L. purpurata* and *C. Gaskelliana* (Sander).
Charles Darwin *L.-C. elegans Turnerii* and *C. maxima* (Ingram).
Charlesworthii *L. cinnabarina* and *C. Dowiana aurea* (Charlesworth).
Choletiana *L. superbiens* and *C. Mossiæ* (Low and Sander).
Cicero *C. intermedia* and *L.-C. elegans Turnerii* (Ingram).
claptonensis *L.-C. elegans* and *C. Dormaniana* (Low).
Clive Syn. *Ingramii* (Cookson).
Clonia *C. Warscewiczii* and *L.-C. elegans Turnerii* (Veitch).

Lælio-Cattleya.

Clytie	*C. Dowiana aurea* and *L. Euterpe* (*Gravesiæ*) (Sander).
Colmaniana	*L.-C. Arnoldiana* and *C. Dowiana aurea* (Sander).
corbeillensis	Syn. *Aurora.*
Cornelia	*L. pumila* and *C. labiata* (Veitch).
Coronis	*L. cinnabarina* and *C. labiata* (Veitch).
Cranstounia	*C. Harrisonæ* and *L. tenebrosa* (Cranstoun).
Cybele	*L.-C. Schilleriana* and *C. Trianæi* (Veitch).
Cypherii	*L. purpurata* and *C. Forbesii* (Cypher).
Cythera	*L. purpurata* and *C. Trianæi* (Veitch).
Daphne	Syn. *Miss Harris.*
Decia	*L. Perrinii* and *C. Dowiana aurea* (Veitch).
dellense	Syn. *Horniana.*
devoniensis	*L. crispa* and *C. guttata* (Veitch).
Diana	*C. Skinneri* and *L. purpurata.*
Diarmid	*L. Perrinii* and *L.-C. elegans Turnerii* (Ingram).
Dido	*C. Skinneri* and *L. tenebrosa* (Rothschild).
Digbyano-Mendelii	*L. Digbyana* and *C. Mendellii* (Maron).
Digbyano-Mossiæ	*L. Digbyana* and *C. Mossiæ* (Veitch).
Digbyano-Trianæ	*C. Trianæi* and *L. Digbyana* (Veitch).
Diogenes	*L. cinnabarina* and *C. guttata Leopoldii* (Charlesworth).
Dominiana (Fig. 87)	*L. purpurata* and *C. Dowiana* (Veitch).
Dora	*C. Schrœderæ* and *L. Hippolyta Phœbe* (Charlesworth).
Doris	*L. harpophylla* and *C. Trianæi.*
D. S. Brown	*C. Trianæi* and *L.-C. elegans* (Sander).
Duchess of York	Syn. *Bryan.*
Duke of York	*L.-C. elegans* and *C. Brymeriana* (Sander).
Duvaliana	*L. purpurata* and *C. Luddemanniana* (Maron).
Edouard Andre	Syn. *Canhamiana.*
Electra	*C. Percivaliana* and *L. purpurata* (Ingram).
Ella	*L. grandis* and *C. intermedia* (Thornton).
Elstead Gem	*C. bicolor* and *L. xanthina* (Ingram).
Empress of India	Syn. *Dominiana.*
Epicasta	*L. pumila* and *C. Warscewiczii* (Veitch).
Ernestii	*C. Percivaliana* and *L. flava* (Maron).
Ethelwald	*C. Gaskelliana* and *L. Boothiana (lobata)* (Paynter).
Eudora	Syn. *Aphrodite.*
Eumæa	*C. Trianæi* and *L. majalis* (Veitch).
Eunomia	*L. Dayana* and *C. Gaskelliana* (Veitch).
Euphrosyne	*L. Dayana* and *C. Warscewiczii* (Veitch).
eximia	*C. Warneri* and *L. purpurata* (Veitch).
exoniensis (Fig. 88)	*C. Mossiæ* and *L. crispa* (Veitch).
Fanny Leon	*C. labiata* and *L.-C. exoniensis* (Leon).
Fascinator	*L. purpurata* and *C. Schrœderæ* (Ingram).
Fausta	*C. Loddigesii* and *L.-C. exoniensis* (Veitch).
Felix	*L. crispa* and *C. Schilleriana* (Veitch).
Firefly	*L. Dormaniana* and *C. Bowringiana* (Ingram).
flaveola	Syn. *G. S. Ball.*
Fortuna	Syn. *Miss Harris.*
Frederick Boyle	*C. Trianæi* and *L. anceps* (Sander).
Galatea	*C. granulosa chofieldiana* and *L. Dayana* (Charlesworth).
Gazelle	Syn. *Andreana.*

Lælio-Cattleya.

Gemma *L.-C. Schilleriana* and *L. xanthina* (Dubel).
General French Syn. *Warnhamensis.*
Ghislainiæ *L. harpophylla* and *C guttata Prinzii.*
Gladys *C. Harrisonæ* and *L. cinnabarina.*
Groganeæ *L. Dayana* and *C. Harrisonæ* (Grogan).
G. S. Ball *L. cinnabarina* and *C. Schröderæ* (Veitch).
Hamiltoni *C. bicolor* and *L. Dayana* (Muller).



FIG. 88. FLOWER OF LÆLIO-CATTLEYA EXONIENSIS

(⅓ nat. size).

Haroldiana *L. tenebrosa* and *C. Hardyana* (Charlesworth),
Harrisonæ-præstans .. *C. Harrisonæ* and *L. pumila* (Low).
Haywardiana Syn. *Hippolyta.*
Helena *L. cinnabarina* and *C. Schilleriana* (Charlesworth).
Henry Greenwood *L.-C. Schilleriana* and *C. Hardyana* (Maron).
Herga *L.-C. elegans Turnerii* and *C. Gaskelliana* (Low).
Herman Holmes Syn. *purpurato-Schilleriana* (Holmes).

Lælio-Cattleya.

Hermione	*C. Luddemanniana* and *L. Perrinii* (Veitch).
Herode	*C. O'Brieniana* and *L.-C. elegans Turneri* (Peeters).
Hettie	Syn. *bletchleyensis.*
highburyensis	*C. Lawrenceana* and *L. cinnabarina* (Chamberlain).
Hippolyta	*L. cinnabarina* and *C. Mossiæ* (Veitch).
Hodgkinsonæ	*L. harpophylla* and *C. Mossiæ* (Hodgkinson).
Homère	*L. Perrinii* and *C. Percivaliana* (Maron).
Hon. Mrs. Astor	*L. xanthina* and *C. Gaskelliana* (Sander).
Horniana	*L. purpurata* and *L.-C. elegans* (Horn).
Hurstii	Syn. *Diana* (Hurst).
Hyeana	*L. purpurata* and *C. Lawrenceana* (Veitch).
Ibera	*L.-C. bella* and *L. cinnabarina* (Veitch).
Illione	*C. Bowringiana* and *L.-C. Dominiana langleyensis* (Veitch).
illustris	Syn. *Epicasta* (Ingram).
Imperatrice de Russie	Syn. *Digbyano-Mendellii.*
Ingramii	*L. Dayana* and *C. Dowiana aurea* (Ingram).
Ino	Syn. *Cassandra.*
intermedio-cinnabarina	Syn. *Amelia* (Charlesworth).
intermedio-flava	*C. intermedia* and *L. flava* (Maron).
Isabella	Syn. *Fascinator.*
Isis	*L. pumila* and *C. Mastersoniæ* (Veitch).
Issy	*L. tenebrosa* and *C. guttata Leopoldii* (Charlesworth).
Ivernia	*L.-C. cailistoglossa* and *L. tenebrosa* (Charlesworth).
Jacobiana	Syn. *Aphrodite.*
Janet	Syn. *Aurora.*
Josephine	*L. purpurata* and *C. chocoënsis* (Chamberlain).
Juno	*C. Mossiæ* and *L. majalis* (Cookson).
Kranzlinii	*C. Mossiæ Wagnerii* and *L.-C. elegans prasiata* (Sander).
Lady Miller	*L. cinnabarina* and *C. granulosa Schofieldiana* (Miller).
Lady Rothschild	*L. Perrinii* and *C. Warscewiczii* (Veitch).
Lady Wigan	Syn. *Canhamiana.*
La France	*L. tenebrosa* and *C. bicolor* (Mantin).
La Fresnaie	*C. guttata Leopoldii* and *L.-C. elegans* (Doin).
leucasta	*C. bicolor* and *L. harpophylla* (Veitch).
leucoglossa	*L.-C. Fausta* and *C. Loddigesii* (Veitch).
Lily Measures	*L.-C. Arnoldiana* and *L.-C. Gottoiana* (Sander).
Lucasiana	*C. labiata* and *L. tenebrosa* (Maron).
Lucia	*C. Mendellii* and *L. cinnabarina* (Clarke).
Lucilia	*L.-C. elegans* and *C. Dowiana* (Veitch).
Ludovici	Syn. *Kranzlinii.*
luminosa	*L. tenebrosa* and *C. Dowiana aurea* (Charlesworth).
Luna	*C. Harrisonæ* and *L. harpophylla* (Charlesworth).
Mabel	*Trianæi* and *L. tenebrosa* (Leon).
Madame Marguerite Fournier	*L. Digbyana* and *C. labiata* (Maron).
Magnet	*L. tenebrosa* and *C. granulosa Schofieldiana* (Peeters).
Major-General Baden-Powell	*L. tenebrosa* and *C. Lawrenceana* (Hye).
Mardellii	*C. Luddemanniana* and *L.-C. elegans* (Veitch).
Marica	*L. cinnabarina* and *C. guttata Prinzii* (Young).
Marie Speransky	*L. purpurata* and *C. Skinnerii* (Leemann).
Marriottiana	*L. flava* and *C. Skinnerii* (Marriott).

Lælio-Cattleya.

Martineti *C. Mossiæ* and *L. tenebrosa* (Maron).
Massangeana *L. tenebrosa and C. Schilleriana* (Peeters).
massiliensis *L. crispa* and *C. Trianæi* (Chamberlain).
Mauve Queen *C. Warnerii* and *L. crispa* (Cowper).
Maynardi *L. Dayana* and *C. dolosa* (Sander).
Meteore *L. Dayana* and *C. Bowringiana* (Ingram).
Minerva *L. Perrinii* and *C. Lawrenceana* (Ingram).
Miss Harris *C. Mossiæ* and *L.-C. Schilleriana* (Harris).
Mrs. Birkbeck *L. purpurata* and *L.-C. callistoglossa* (Wigan).
Mrs. Maron *C. Warscewiczii* and *L. Digbyana* (Maron).
Mylameana *C. granulosa* and *L. crispa* (Rollison).
Myra *C. Trianæi* and *L. flava* (Veitch).
Nephelia *C. Mossiæ* and *L.-C. Amesiana* (Veitch).
New Century Syn. *velutino-elegans.*
nivalis *L. glauca* and *C. intermedia* (Maron).
Normanii Syn. *Ingramii*
Novelty *L. Dayana* and *L.-C. elegans* (Veitch).
Nysa *L. crispa* and *C. Warscewiczii* (Veitch).
odorata *C. eldorado* and *L. xanthina* (Ingram).
olivetiensis *L. pumila* and *C. Leopoldii* (Mantin).
Ophelia Syn. *Tiresias* (Charlesworth).
Ophir *L. xanthina* and *C. Dowiana aurea* (Veitch).
Orpheus *L. glauca* and *C. Trianæi alba* (Veitch).
Osyana *L. harpophylla* and *C. Leopoldii* (Peeters).
Othello Syn. *Charles Darwin* (Ingram).
Our Queen Syn. *C. G. Roebling.*
Pallas *L. crispa* and *C. Dowiana* (Veitch).
Parisiana Syn. *eximia* (Hye).
Parysatis *C. Bowringiana* and *L. pumila* (Veitch).
Phalaris Syn. *Galatea.*
Philbrickiana *C. Aclandiæ* and *L.-C. elegans* (Veitch).
Phœbe Syn. *Hippolyta* (Cookson).
Phryne *C. Warscewiczii* and *L. xanthina* (Veitch).
Pisandra *L. crispa* and *C. eldorado* (Veitch).
Powelli *L.-C. Schilleriana* and *C. Mendellii* (Brymer).
præstans bicolor *L. præstans* and *C. bicolor* (Lawrence).
Pringiersii Syn. *Horniana.*
Proserpine *L. Dayana* and *C. velutina* (Veitch).
purpurato-Aclandiæ .. *L. purpurata* and *C. Aclandiæ* (Duval).
purpurato-Schilleriana *L. purpurata* and *C. Schilleriana* (Maron).
Pytho Syn. *Zenobia* (Ingram).
Queen Alexandra *C. Trianæi* and *L.-C. Bella* (Veitch).
Radiance Syn. *L.-C. Dominiana* (Ingram).
radiata *L. purpurata* and *C. dolosa* (Maron).
regalis Syn. *L.-C. Aphrodite* (Maron).
Regina Syn. *Cicero* (Ingram).
Reginæ Syn. *Cypherii* (Mantin).
Remula *C. Aclandiæ* and *L. tenebrosa* (Veitch).
Ridolfiana Syn. *Canhamiana.*
Robin Measures *C. granulosa* and *L. xanthina* (Sander).
Rosalind *C. Trianæi* and *L.-C. Dominiana* (Veitch).
Rosamond Taylor Syn. *Lady Miller.*
Roy Wigan Syn. *bletchleyensis.*
Ruby Gem *C. Lawrenceana* and *L.-C. elegans* (Ingram).
Sallierii *L. purpurata* and *C. Loddigesii* (Maron).
Sanderæ Syn. *Elstead Gem* (Sander).

Lælio-Cattleya.

Santiago	*L.-C. Hyppolyta Phœbe* and *C. intermedia Parthinia* (Ames).
Schutzeriana	*L.-C. elegans* and *C. labiata* (Linden).
Sedenii	*C. superba* and *L.-C. elegans* (Veitch).
Semiramis	*L. Perrinii* and *C. Gaskelliana* (Veitch).
Seraph	*L.-C. elegans* and *C. citrina* (Ingram).
Sir William Ingram ..	Syn. *Dominiana* (Ingram).
Smarti	*L.-C. elegans* and *L.-C. callistoglossa* (Maron).
Stanleyensis	Syn. *Ingramii* (Statter).
Statteriana	*L. Perrinii* and *C. labiata* (Veitch).
Stella	*L. crispa* and *L.-C. elegans* (Veitch).



FIG. 89. FLOWER OF LÆLIO-CATTLEYA THORNTONII (much reduced).

Stelznero-Hardyana ..	Syn. *Henry Greenwood* (Maron).
Sunray	*L. cinnabarina* and *C. superba* (Charlesworth).
superbo-elegans	*C. superba* and *L.-C. elegans* (Maron).
Templea	Syn. *Mardellii*.
Terentia	*L. crispa* and *C. bicolor* (Veitch).
Thetis	Syn. *Cassiope* (Lawrence).
Thorntonii (Fig. 89) ..	*C. Gaskelliana* and *L. Digbyana* (Thornton).
tigrina	Syn. *Philbrickiana*.
Timora	*L. Dayana* and *C. Luddemanniana* (Veitch).
Tiresias	*C. Boweringiana* and *L.-C. elegans* (Veitch).

Lælio-Cattleya.

Topaz	*L. cinnabarina* and *C. Warnerii* (Charlesworth).
trentoniensis	Syn. *Novelty*.
Tresideriana	*L. crispa* and *C. Loddigesii* (Heath).
triophthalma	*C. superba* and *L.-C. exoniensis* (Veitch).
Truffautiana	Syn. *luminosa*.
T. W. Bond	Syn. *bella* (Ingram).
Tydæa	*L. pumila* and *C. Trianæi* (Veitch).
tyntesfieldiensis	Syn. *Dominiana* (Hardy).
Vadastii	*L. pumila* and *C. Loddigesii*.
Valvassorii	Syn. *eximia*.
Veitchiana	*C. labiata vera* and *L. crispa* (Veitch).
velutino-elegans	*C. velutina* and *L.-C. elegans* (Maron).
Venus	*L.-C. elegans Turnerii* and *L. Percivaliana* (Ingram).
Victoria	*L. crispa* and *L.-C. Dominiana* (Schrœder).
Violetta	Syn. *C. G. Roebling*.
vitellina	*L. harpophylla* and unrecorded (Schrœder).
warnhamensis	*L. cinnabarina* and *C. Trianæi Normanii* (Lucas).
weedoniensis	Syn. *Sallierii* (Thornton).
Wellsiæ	Syn. *eximia* (Sander).
Wellsiana	*C. Trianæi* and *L. purpurata* (Sander).
Wiganiæ	*L.-C. Gottoiana* and *C. Mossiæ* (Maron).
Wiganiana	*L. purpurata* and *L.-C. Dominiana* (Wigan).
Wilmer	Syn. *La France*.
Wilsoniæ	*C. labiata* and *L. Dayana* (Sander).
Wrigleyana	*L. anceps* and *C. Bowringiana* (Wrigley).
Yellow Prince	Syn. *Hon. Mrs. Astor* (Leemann).
Zenobia	*C. Loddigesii* and *L.-C. elegans* (Veitch).
Zephyra	*C. Mendellii* and *L. xanthina* (Veitch).

Natural Hybrids.

albanensis	*C. Warnerii* and *L. grandis*.
amanda	*C. intermedia* and *L. crispa* or *L. Boothiana*.
Binoti	*C. bicolor* and *L. pumila* (Peeters).
Broomiana	*L.-C. elegans* and unknown.
elegans	*L. purpurata* and *C. Leopoldii*.
Gottoiana	*C. Warnerii* and *L. tenebrosa*.
intricata	*C. intermedia* and *L.-C. elegans*.
Leeana	*C. Loddigesii* and *L. pumila*.
Oweniæ	*L. Perrinii* and unknown.
Pittiana	*G. guttata Prinzii* and *L. grandis*.
purpurato-intermedia	Syn. *L.-C. Schilleriana*.
purpurato-Leopoldii	Syn. *L.-C. elegans*.
Schilleriana	*L. purpurata* and *C. intermedia*.
Verellii	*L. Boothiana* and *C. Forbesii*.

LÆLIOPSIS (*Lindl.*). This is now included under **Broughtonia.**

LEIOCHILUS. An erroneous name for **Leochilus.**

LEOCHILUS.

Four or five species of stove, epiphytal Orchids, belonging to the tribe *Vandeæ*, have been included under the name *Leochilus* (erroneously *Leiochilus*), *Kn.* and *Westc.* The name is derived from *leios*, smooth, and *cheilos*, a lip. The species are natives of the West Indies, Mexico, and Central America. They are closely allied to *Oncidium*, differing in having the arms of the column placed below the stigma, and by the presence of a honey-pore at the base of the lip. Flowers usually yellow, small, racemose. Leaves oblong or narrow, flat, narrowed into the petiole. The cultural requirements are similar to those for the warm intermediate-house Oncidiums. Only one species is grown and that but rarely.

L. oncidioides (*Kn.* and *Westc.*).—A spring-flowering Oncidium-like species, having yellowish-green flowers tinged with red and spotted with pale purple on the lip. The ovate or oblong-ovate, smooth, green pseudo-bulb is crowned with a single oblong-lanceolate, rather rigid but scarcely coriaceous, acute leaf. It was introduced from Mexico in 1840. (B. M., t. 3845, under name of *Oncidium macrantherum.*)

LEPTOTES (*Lindl.*). This is now included under **Tetramicra.**

LIMATODES (*Blume*). This is now included under **Calanthe.**

LIMODORUM TUBEROSUM (*Linn.*). A synonym of *Calopogon pulchellus.*

LIPARIS.

About one hundred species of stove or hardy terrestrial or epiphytal Orchids, of the tribe *Vandeæ*, are found in the above genus, established by Richard. The name is derived from *liparos*, smooth, and is in reference to the leaves. The species are broadly dispersed through the temperate and warm regions of the globe. Flowers usually dull white, green, or yellow, small, racemose; column rather long, semicircular or two-winged in the upper part, but not branched. Leaves few, sometimes solitary at the base, or below the middle of the stem, on sheathing petioles, often at length contracted at the joint, membranaceous or slightly fleshy, equally many-nerved or sparingly ribbed.

Liparis.

Very few species are worth growing. The hardy sorts thrive in a moist, shady situation, and do best when planted very shallow, and covered with moss. The stove kinds require a compost of fibry peat, sphagnum, and a liberal sprinkling of rough sand, and are most suitably grown in shallow pans or baskets. *L. liliifolia* (*A. Rich.*) is the North American Twayblade. The species are rarely seen in cultivation outside botanic collections.

LISSOCHILUS.

Some thirty species of terrestrial Orchids, of the tribe *Vandeæ*, several of them decidedly handsome and distinct in character, are comprised in this genus, founded by Robert Brown. The name is from *lissos*, smooth, and *cheilos*, a lip. The pseudo-bulbs are fleshy when young, hard and almost woody when old; they are usually underground. The leaves are more or less lance-shaped, with prominent longitudinal nerves. The flowers are borne on long, stout, many-flowered scapes, springing from the pseudo-bulbs. A distinguishing character of the flower is the dissimilarity of the sepals and petals—the latter being much larger, and generally different in colour. The lip is saccate, and is joined to the base of the column. All the species are native of Southern and tropical Africa.

Culture.—These plants are most successfully grown in pans, in a compost of fibrous peat, leaf-soil, and a little coarse silver-sand. When in full growth, they must be freely supplied with water; but in order to insure flowering it is necessary in winter to keep them dry for about three months. During active growth, weak manure-water may be given at intervals of a week or a fortnight. With the exception of *L. giganteus*, the species here described may be grown with the Cattleyas. The culture of *L. giganteus*, of which but few plants are at present introduced, is less understood. Naturally, it grows on the banks of the River Congo, in shallow pools and marshy places; in the dry season, however, the soil becomes parched, and it receives a thorough baking. From this we may infer that during activity the plants should be given the moistest, hottest position in the stove—the soil being kept saturated. As

growth ceases, water must be given more and more sparingly, always remembering to proportion the length of the resting period to the vigour of the plants and their growth during the previous season.

L. giganteus (*Welw.* and *Rchb. f.*).—This remarkable and beautiful plant is one of the giants of the Orchid family. Travellers state that in its native country its leaves reach a length of 8ft., and its flower-spikes a height of 16ft. The first plant that flowered in England was in the possession of Sir Trevor Lawrence. The leaves of this plant were plaited, about 4ft. long by 4in. wide, and pointed at the tips. The flower-spike was 8ft. 8in. high, and towards the top about fifteen flowers were somewhat loosely arranged. The flowers are from 3in. to 4in. across; the greenish sepals are strap-shaped, and curl back towards the ovary; the petals, which are broadly oblong, and over 1½in. in diameter, form a kind of hood over the lip, and are of a pinkish-rose colour. The lip is 3in. long, trowel-shaped in front, narrowing at the base into a pointed spur, which stands out behind the rest of the flower; it is purple, striped with darker lines, and marked on the centre with three yellow lines. The species was discovered by Dr. Welwitzsch, in 1866, on the banks of the River Congo; it first flowered under cultivation in May, 1888. (G. C., iii., 1888, fig. 83.)

L. Krebsii (*Rchb. f.*).—On account of the distinct character of its flowers, and the length of time they remain in perfection, this is a useful and desirable garden Orchid. The pseudo-bulbs are green, 2in. to 3in. high, and bear lance-shaped, plaited, bright green leaves, 8in. to 12in. long. The flower-scape is 1½ft. to 2ft. high, and from the upper portion it produces from twenty to thirty flowers, each measuring 2in. across; the sepals are greenish-brown, blotched with dull purple, and the petals, which are three or four times as large, are of a bright golden-yellow; the lip is three-lobed, the side lobes being erect and similar in colour to the sepals; the middle lobe is nearly orbicular, notched in front, and of a pale golden-yellow. Introduced from Natal in 1867. It flowers from May to October. (B. M., t. 5861.)

L. speciosus (*R. Br.*).—An old and ornamental species, with roundish, underground pseudo-bulbs, and stout, sword-shaped, dark green leaves. The flower-scape is erect, from 2ft. to 4ft. high, the flowers, which are 2in. in diameter, and fragrant, being confined to the upper half; the green sepals are small and reflexed; the petals are oblong, much larger than the sepals, and of a bright yellow; the lip is about 1in. long, mainly yellow,

Lissochilus.

but at the base is white, veined with purple. In this species the flowers are inverted, the lip being uppermost. A flower-scape will continue blossoming for two months, being in full beauty in June and July. Cape of Good Hope, 1818. (B. R., t. 573, but usually given as 578.)

LISTERA.

Robert Brown's name (a complimentary one to Martin Lister) for a genus embracing about ten species of hardy terrestrial Orchids of the tribe *Neottieæ*, found in Europe, Northern Asia, and America, and readily known from the small-flowered, spurless British Orchids by the two leaves borne at some distance from the ground, placed so near together as to appear opposite. Flowers green, small, in a slender raceme. *L. cordata* and *L. ovata* are British plants, the latter being popularly known as Twayblade. The species are not very attractive.

LISTROSTACHYS (*Rchb. f.*). *See* **Angræcum.**

LOCKHARTIA.

A few species of stove, epiphytal Orchids of the tribe *Vandeæ*, rarely met with outside botanic gardens, are comprised in this genus, for which Hooker is sponsor. The name is a complimentary one to David Lockhart, the traveller. Flowers small and mediocre, rather long-stalked; sepals and petals sub-equal, free, spreading or laterally reflexed; lip free at the base of the very short column; peduncles in the upper axils, sometimes two-flowered. The species are natives of tropical America, from Brazil to the West Indies, and Mexico. The genus as now understood includes *Fernandezia*.

LUEDDEMANNIA.

At one time this small genus of interesting and attractive stove Orchids, of the tribe *Vandeæ*, was included under *Cycnoches*. Present-day botanists, however, respect the above name given by Reichenbach the younger in honour of Herr Lueddemann. The species are natives of South America. Ovary velvety; sepals oblong, acute, fornicate;

Lueddemannia.

petals cuneate-oblong, acute; peduncle pendulous, very many flowered. *L. Lehmanni* and *L. Pescatorei* are the most attractive species. For culture, *see* **Stanhopea.**

L. Lehmanni (*Rchb. f.*).—The flowers of this species are exceedingly showy, not to say handsome, and are produced in a raceme. The sepals are salmon-coloured, and the petals and lip orange. The pseudo-bulbs are long, pear-shaped, and furrowed. Colombia, 1880.

L. Pescatorei (*Rchb. f.*).—Though by no means so attractively coloured as the preceding species, the flowers are abundantly produced in July. The sepals are a dull yellow, with a little brown inside; the petals and lip are a bright yellow. The leaves are leathery, glaucous, and lanceolate. The whole plant gives off a peculiar odour, likened unto that exhaled by decaying oranges. Colombia, 1848. (P. F. G., i., p. 123; B. M., t. 7123.)

LUISIA.

Of the ten species belonging to the genus *Luisia* (*Gaud.*), of the tribe *Vandeæ*, it is seldom that one is found outside botanic collections. The generic name is a complimentary one to the Spanish botanist Don Luis de Torres. The species are warm-house epiphytal Orchids, natives of the East Indies and Eastern Asia, extending from the Malayan Archipelago to Japan. Some few of the species are curious, inasmuch as they have a resemblance to insect or to bird, &c. *L. cantharis* (*Rolfe*), for instance, is beetle-like (hence the specific name); while *L. volucris* is bird-like in form. The dingy green, purplish, or yellowish sub-sessile flowers are produced in lateral spikes. Foliage terete, rigid, rush-like. Stems erect. The plants do best when grown in baskets, in a compost consisting wholly of sphagnum. They require plenty of humidity in the atmosphere during the growing season.

L. Amesiana (*Rolfe*).—The sepals and petals are ovate and greenish-yellow in colour; the lip is large and red-spotted. The leaves are terete. Burma, 1890. (G. C., 1893, xiv., p. 32, fig. 8.)

LYCASTE.

Every amateur's collection should include representatives of this genus, which belongs to the tribe *Vandeæ*, and

Lycaste.

was founded by Lindley, all the species being of easy culture, and noted for their free-flowering qualities. The name is after Lycaste, the beautiful daughter of Priam. The species have short, thick pseudo-bulbs, varying in different species from 1½in. to 6in. in height. The leaves are two to four in number, plaited, acuminate, and being of a bright shining green, and firm in texture, the plants, even when not in flower, have a luxuriant appearance. The flower-scapes, which are generally numerous, spring from the base of the pseudo-bulbs, and usually carry a single flower; in vigorous specimens, however, twin-flowered scapes are not uncommon. The flowers are large, and, although somewhat stiff in appearance, they are very handsome; the sepals are erect, the dissimilar petals folding more or less forward over the column; the lip is three-lobed, the middle lobe being furnished with a transverse fleshy appendage. The flowers remain fresh on the plants for several weeks; they are also useful for cutting. There are upwards of thirty species in cultivation, all of which are natives of tropical America and the West Indies. By growing the selection enumerated, Lycastes may be had in flower nine or ten months out of the year. This genus now includes *Paphinia*.

Culture.—These plants may be recommended to the beginner in Orchid-culture, because there are none more likely to give satisfaction. They require but little heat, and may be successfully grown with the cooler Odontoglossums. They should be planted in well-drained pots or pans; a compost of fibry peat and chopped sphagnum, with a dash of silver-sand, will be found to suit them admirably. Copious supplies of water must be afforded during the period of active growth, and, although the quantity should be reduced in winter, in accordance with the decreased amount of sunshine, the plants should at no time be allowed to get dry at the root.

L. aromatica (*Lindl.*).—A species chiefly desirable on account of the aromatic odour of its flowers, which are produced in great profusion, and measure 3in. across. The pseudo-bulbs are about 2in. high, and are compressed, bearing on the apices the broadly lance-shaped, plaited leaves. The one-flowered scapes are slender, erect, and about 4in. in length. The sepals and petals are of a pretty golden-yellow, with a greenish tinge

on the outer side. The lip is three-lobed, and, by the side lobes curving upwards, is made to assume a somewhat cylindrical shape; it is hairy, and is marked on the inner side with orange-coloured spots. This species flowers in June or July, and lasts in beauty over a month. It is a native of Mexico, whence it was introduced in 1828. (B. R., t. 1871.)

L. Deppei (*Lindl.*).—An old and well-known species, though not much grown. It is one of the most useful, and, on account of its free-flowering character, deserves to be in every collection. The pseudo-bulbs and leaves are similar to those of *L. aromatica*, but are slightly more robust. The flowers are 4in. across, the sepals being oblong, and green, marked with transverse lines of brownish-purple spots; the petals are pure white, and not so large as the sepals; the hood-shaped lip is yellow, marked with crimson dots. This species flowers at various periods, but generally during the spring and summer. It was introduced from South Mexico in 1828. (B. M., t. 3395.)

L. Harrisoniæ (*Rchb. f.*).—A synonym of *Bifrenaria Harrisoniæ.*

L. macrophylla (*Lindl.*).—This is a robust as well as an ornamental species, with large, ribbed pseudo-bulbs, and pointed, oval leaves. The flowers are from 3in. to 4in. across, the oblong sepals being of a pretty madder-red; the petals, which are smaller, and recurved at the tips, are white, marked with a crimson-coloured blotch; the lip is still smaller, white, spotted with rosy-crimson. This species was introduced from Bolivia about 1840; it flowers during the winter months. Syn. *L. plana.* (B. R., 1843, t. 35.)

Var. *Measuresiana* has reddish-brown sepals tipped with green and green outside; petals and lip white, spotted with rose-purple, except the margins. It is free flowering.

L. plana (*Lindl.*).—A synonym of *L. macrophylla.*

L. Skinneri (*Lindl.*). — In every way this species is certainly one of the most desirable of all Orchids. It is one of the easiest to grow, and, if treated in a proper manner, never fails to reward the grower with an abundance of flowers. Moreover, it may be purchased at a price within the means of all. The pseudo-bulbs are oblong, 3in. to 5in. high, and bear two or three broadly lance-shaped, dark green, plaited leaves. The flowers are large and strikingly handsome. The scapes are one-flowered, and spring from the base of the pseudo-bulb. The

Lycaste.

flowers are very variable in colour; indeed, it is difficult to get two plants with flowers exactly alike. The oblong, pointed sepals are typically of a bluish-white, but in other forms deepen in colour to bright rose, and even to a deep mauve. The

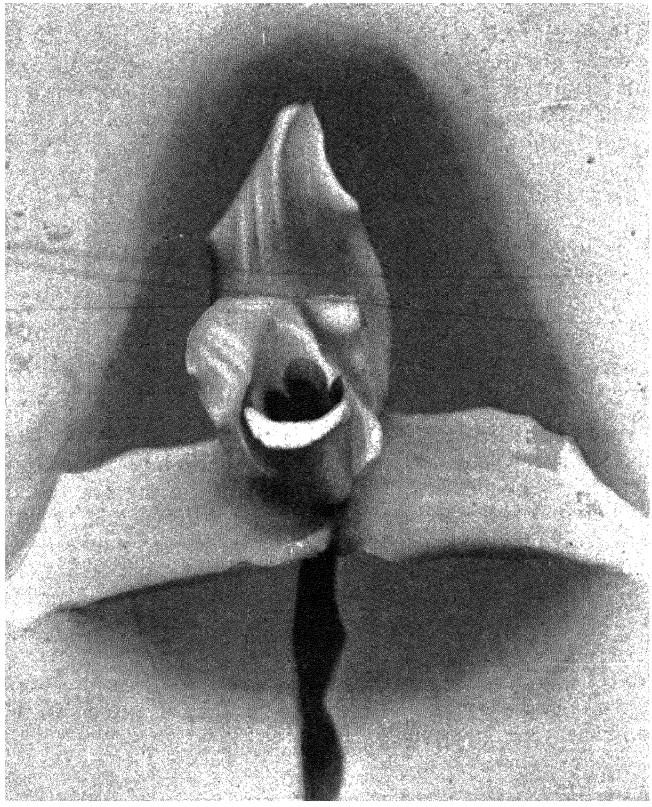


FIG. 90. FLOWER OF LYCASTE SKINNERI ALBA
(much reduced).

petals stand forward at each side of the column; they are about half the size of the sepals, and are usually of a deep rose-colour. The three-lobed lip is white, spotted with crimson. This species flowers from November to May, the blossoms lasting

Lycaste.

several weeks in perfection. It is a good plan during the summer months to give the plants a watering with a weak solution of cow-manure about every seven days. Such treatment materially adds to the vigour of the growths and to the subsequent floriferousness of the plants. A native of Guatemala; introduced in 1842. (B. M., t. 4445.)

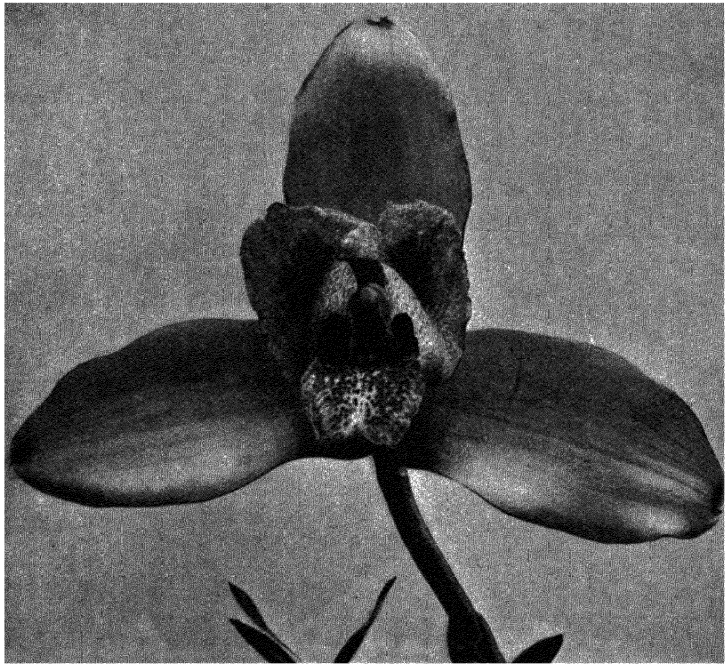


FIG. 91. FLOWER OF LYCASTE BALLIÆ (nat. size).

There are numerous named forms of this species in gardens; of these the most distinct being

Var. *alba*.—A rare, and at present an expensive Orchid. Its beautiful flowers are of the usual size, but wholly of a pure white, except on the centre of the lip, where they are faintly tinged with yellow. (Fig. 90.)

Lycaste.

L. tetragona (*Lindl.*).—An interesting plant, very remarkable in the colour of its flowers. In habit, pseudo-bulbs, and leaves, it is similar to the well-known *Bifrenaria Harrisoniæ*. The flowers also resemble those of that plant, except in colour and substance. Scapes short, three-flowered; sepals and petals broad-ovate, pointed, green, with lines and blotches of chestnut; lip hollow, fleshy, white, with blotches of crimson near the tip, outside, purple within. The flowers remain fresh for nearly two months, and are very fragrant. Introduced from Brazil in 1827, and flowered at Kew in 1829. (B. M., t. 3146.)

L. tricolor (*Klotzsch*).—At present this is a very rare species, and little known in our gardens; it is, however, one of the most beautiful and floriferous of Lycastes. It has ovate, compressed pseudo-bulbs, about 2in. high, bearing two or three deep green, lance-shaped leaves. The flower-scapes, as in the other species, are clustered round the base of the pseudo-bulbs, and each bears a single flower, 3in. in diameter; the spreading, pale brown sepals are oblong, pointed, and slightly recurved; the rose-coloured petals are smaller than the sepals, and broader towards the apex; the lip is still smaller, toothed at the margin, and of a deep rose-colour. It is a native of Guatemala.

GARDEN AND NATURAL HYBRIDS.

Balliæ (Fig. 91)	*Skinneri* and *macrophylla Measuresiana* (Ball).
hybrida	*Skinneri* and *Deppei*.
Imschootiana	*Skinneri* and *cruenta* (Imschoot).
Janetæ	*Skinneri* and *Rossiana* (Ross).
Mary Gratrix	*Skinneri* and *macrophylla Measuresiana*.
Schoenburnensis	*Skinneri* and *Schilleriana* (Schoenburn).
Smeeana	*Deppei* and *Skinneri* (Smee).
Sulphurea	*Deppei* and *cruenta*.

MACODES.

As now constituted, this genus contains about five species, allied to, and frequently met with in cultivation under the name of, *Anæctochilus*. It belongs to the tribe *Neottieæ*, and was originally described by Lindley, the name being derived from *makos*, length, in reference to the shape of the labellum. The culture is identical with that of *Anæctochilus*.

M. javanica (*Hook. f.*).—A large-leaved, prettily-marked species, with leaves 4in. long by 2½in. broad, suddenly narrowed at the ends; the colour is apple-green, with numerous transverse veins of silver-grey; the under surface is tinted rose. Java. (B. M., t. 7037.)

Macodes.

M. Petola (*Lindl.*).—This very beautiful and easily cultivated species grows rapidly, forming stems 6in. or more long, which are clothed with oval leaves, 3in. by 2in., fleshy in texture, the surface a soft, mossy, shining green, the veins being of a pale golden, sparkling colour. There are several fine examples of this charming little Orchid in the Kew collection. In Java it is exceedingly plentiful, but from the nature of its stems it is difficult to import alive. Syn. *Anœctochilus Petolus.* (Fig. 92 ; X., t. 96.)

M. Rollissonii (*Hort.*).—A synonym of *Goodyera Rollissonii.*

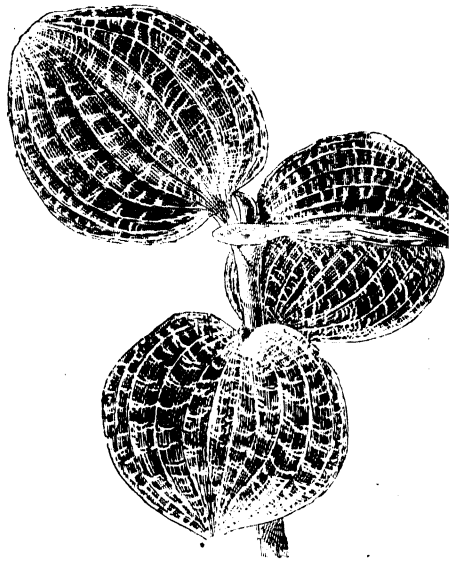


FIG. 92. MACODES PETOLA (⅓ nat. size).

MACRADENIA.

A genus of two or three species of epiphytal Orchids, natives of the West Indies. They belong to the tribe *Vandeæ.* The name, given by Robt. Brown, is derived from *makros*, long, and *aden*, a gland, and is in reference to the long process of the pollen-masses. The species are closely allied to, and require the same cultural conditions as, the warm-growing species of *Oncidium.*

M. lutescens (*R. Br.*).—Flowers dingy yellow, spotted with brownish-purple; lip undivided, cucullate-concave, taper-pointed; peduncle four- or five-flowered. The flowers are produced in November. (B. R., t. 612.)

MASDEVALLIA.

A large number of terrestrial Orchids peculiar to tropical America, and especially numerous in Colombia,

Masdevallia.

are included in this genus, belonging to the tribe *Epidendreæ*. It was founded by Ruiz and Pavon, and named in compliment to Dr. Masdevall, a Spanish botanist and physician. Probably 150 species have been described, and new additions are constantly being made. Although a large proportion of the species are wanting in size of flower and colour attraction, yet, owing to the very singular, often grotesque, forms assumed by the flowers, many of them are in cultivation in the gardens of at least a few specialists. (Fig. 93.) Sir Trevor Lawrence, Bart., M.P. (Burford, Dorking), and Mr. R. I. Measures, of Camberwell, have the most extensive collections of Masdevallias. In the Botanic Gardens at Glasnevin there is also a well-cultivated and rich collection.

All the species have a tufted habit, green, strap-shaped or spoon-shaped leaves, and flowers in which the sepals are much more conspicuous than the petals and lip, these latter organs being often entirely hidden in the tube formed by the union of the sepals at the base. The variety of form and arrangement shown in the sepals of these plants is probably unequalled in any other genus of Orchids. The section represented by *M. Chimæra* is, as the name denotes, most fantastic—"dog-fish like, a floral octopus"—in flower-character; the simple shape of *M. coccinea*, *M. ignea*, and all of that section, is insignificant in comparison with their colour-brilliancy; whilst in the jewel-like flowers of the tiny species, such as *M. tridactylites* and *M. triglochin*, there is great beauty of structure as well as of colour. In 1865 there were scarcely half-a-dozen species known in gardens; then came the snowy *M. tovarensis*, followed by the flame-coloured *M. Veitchiana*, and the popularity of Masdevallias was at once assured.

The peculiar form and colour of the flowers—the former often grotesque, and the latter brilliant in some cases, lurid in others—have won for this genus exceptional favour with cultivators. Amongst the many charms that Masdevallias possess must be reckoned one which, till recently, was scarcely known to exist in the great Orchid family—sensitiveness, such as is possessed by Venus' Fly-trap and the Sensitive Plant. At Kew, in 1887, a small plant of *M. muscosa* flowered for the first time

Masdevallia.

in England. It had short, thick leaves, erect, hairy flower-scapes, and flowers ½in. across; the lip was hinged, and had a concave blade, ¼in. long, in the middle of which was a raised, yellow disk. On touching this disk, the lip moved upwards and closed with a jerk, and it was found that any small insect on alighting on the lip was at once trapped and held for about twenty minutes, when the lip opened again. Charles Darwin, who regretted never having seen a sensitive Orchid, would have been delighted had he seen this plant.

Culture.—Although the robust-growing Masdevallias—that is, those belonging to the *M. coccinea*, *M. ignea*, *M. Veitchiana*, and *M. amabilis* section, and the thick-foliaged kinds of the *M. leontoglossa* and *M. Mooreana* section—may all be cultivated under the same conditions as those advised for Odontoglossums, yet where a house can be set apart for them they are undoubtedly more easily and satisfactorily dealt with. The temperature of the house should be kept as low as the outside conditions permit, during the summer months. Moisture in the atmosphere is the chief cultural requirement, an abundance of it being necessary during the hot season, and a discreet supply during the winter.

While active, all Masdevallias require liberal moisture at the roots, as well as a humid condition of the atmosphere. During winter, when the plants are, or should be, dormant, the temperature of the house should be maintained at from 50deg. to 55deg. The plants should then be kept drier at the roots, and the atmosphere of the house so controlled that any sudden fluctuations of the outside temperature may be easily contended with. If the conditions of the atmosphere, and the moisture at the roots, were oftener considered during the winter, it is probable that the "Black Spot" that so disfigures the foliage of Masdevallias would cease to exist. There is no doubt that the unsightly appearance presented in so many places is induced by excessive moisture during periods of dull, damp weather, and frequently by excessive moisture in the atmosphere when low temperatures, due to cold conditions and sudden fluctuations outside, prevail.

The *M. Chimæra* section, and the small-growing kinds to which such species as *M. Estradæ*, *M. erythrochæte*,

Masdevallia.

M. triaristella, *M. muscosa*, and *M. caudata* (*M. Shuttleworthii*) belong, although they do well in the cool-house in summer, must have warmer conditions provided in winter. The conditions that suit them best are a temperature of 55deg. throughout the year. The *Chimæra* section does best when grown in baskets, while the smaller-growing species of the remaining sections are best accommodated in shallow pans, so that they can be suspended near the roof-glass. A little leaf-soil and rough sand mixed with the peat and moss will be found advantageous for this section. *M. tovarensis*, which is a winter-flowering plant, should be grown in warmer and drier conditions during the winter months, the Odontoglossum-house being too humid for it. *M. Wendlandii* is a warm-growing miniature species, best accommodated in shallow pans, and suspended, in winter, in the warm intermediate-house. With the whole family of Masdevallias it is advisable to maintain reasonably dry conditions during the resting season, and especially during periods when there is a difficulty in keeping the temperature at the normal condition of 50deg. Rain-water must always be used for these plants: hard water is resented by both the plants and the sphagnum.

Re-potting is best done in the early spring for the small-growing and *Chimæra* section. The robust-growing species and varieties should be re-potted at the end of August or during September. It is then that the plants emit their new roots, and they immediately establish themselves in the fresh compost, and little if any check is apparent. The moss used should be freshly-gathered, and chopped moderately fine. For drainage, bracken-fern roots may be used with advantage instead of potsherds.

M. abbreviata (*Rchb. f.*).—This species is closely allied to *M. melanopus*, but the flowers have usually far fewer dots. Flowers white, with a few purple spots; racemes few-flowered. Leaves spathulate, obtuse. Colombia, 1878.

M. acrochordonia (*Rchb. f.*).—A species allied to *M. Ephippium*, but with narrower leaves and acuminate petals; peduncle many-flowered; inner surface of the sepals warted; lip with a wavy median keel. Ecuador, 1885.

M. amabilis (*Rchb. f.*).—A graceful species, forming tufts of erect, fleshy, green leaves, 5in. long and ¾in. across, the apex



FIG. 93.—PORTION OF A HOUSE OF MASDEVALLIAS IN FLOWER IN JUNE.

recurved and acute-pointed, the base narrowed to a stalk. Scape 9in. long, erect, one-flowered; tube ¾in. long and curved, carmine above, pinkish below; upper sepal erect, ¼in. wide at the base, narrowed to a tail 1½in. long; lower sepals 1½in. long, joined for about one-third of their length, the pair measuring 1in. across, the free portion narrowed to tails; colour bright rosy-carmine. This species blossoms freely in spring, well-flowered plants making pretty and attractive-coloured specimens. It requires the treatment recommended for *M. coccinea*. Peru, 1872. (Ill. Hort., 1875, t. 196, as var. *lineata*.)

M. anchorifera (*Rchb. f.*).—A synonym of *Scaphosepalum anchoriferum*.

M. astuta (*Rchb. f.*).—A synonym of *M. erythrochæte*.

M. Backhouseana (*Rchb. f.*).—Now regarded as a variety of *M. Chimæra*.

M. bella (*Rchb. f.*).—One of the most remarkable of the species belonging to the *Chimæra* section of the genus. The flowers are large, and strangely formed, suggesting enormous spiders. The leaves are channelled, about 8in. long, broadest at the apex, narrowing downwards to a stalk-like base. The flower-scape is pendent or horizontal, 6in. long, thin and wiry, and bears a solitary flower, in which the three sepals are large, partly united by their edges, forming a kind of triangle, 2in. across; the tails are 4in. long, rather stiff, the upper one bent backwards, the two lower ones forwards and crossing each other; the lip is ¾in. across, kidney-shaped, stalked; and the two small petals form a pair of ear-like appendages to the column. The colour of the sepals and tails is pale yellow, thickly spotted with brown-purple; that of the lip and petals is white. Nothing can be more interesting than a well-flowered example of this species. It requires the treatment recommended for *M. Chimæra*. Colombia, 1878. (Belg. Hort., 1884, t. 3.)

M. Benedicti (*Rchb. f.*).—A synonym of *M. Houtteana*.

M. brevis (*Rchb. f.*).—A synonym of *Scaphosepalum breve*.

M. Bruchmülleri (*Hort.*).—A synonym of *M. coriacea*.

M. calura (*Rchb. f.*).—In this species the flowers have the petals and lip bluish-purple, the inner surface being covered with obtuse warts; column white, with numerous purple freckles; tails long. Costa Rica, 1883.

M. candida (*Kl.* and *Karst.*).—A synonym of *M. tovarensis*.

M. Carderi (*Rchb. f.*).—A pretty little species related to *M. erythrochæte*, but having exceptionally formed flowers. The leaves are rather thin, 5in. long, ¾in. broad, scarcely narrowed

Masdevallia.

at the base. The flowers are borne singly on decumbent scapes 3in. long. The sepals are united, and form a bell-like limb, ¾in. across and ½in. deep, white, with a purplish zone and a yellow base; the tails are 1in. long, spreading, yellow; the inside of the bell is covered with short ferruginous hairs. The petals and lip are small and white. The flowers are nodding and graceful; they are developed in June, and last about a fortnight. The plant requires the same treatment as *M. Chimæra*. From the exceptional colour and form of its flowers, this little species deserves to be included in all good collections. Colombia, 1883. (B. M., t. 7125.)

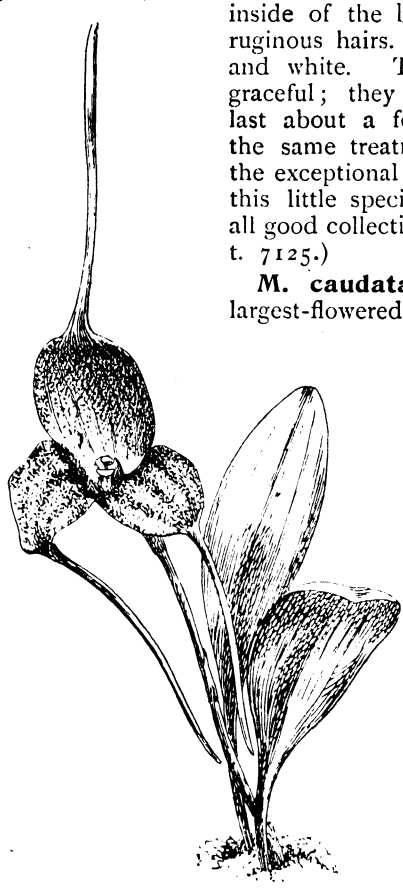


FIG. 94. MASDEVALLIA CAUDATA (⅓ nat. size).

M. caudata (*Lindl.*).—The prettiest and largest-flowered of the smaller species of *Masdevallia*. It has spoon-shaped leaves, seldom exceeding 4in. in length and 1in. in width, the lower half narrowed to a stalk. The scape is 5in. long, erect, one-flowered; the flowers are very large for the size of the plant (1½in. across, not measuring the tails); sepals united at the base, and forming a shallow cup, then spreading, the upper one the largest, concave, ovate, 1in. long, yellowish-red, with numerous deep red dots and parallel, red nerves; lower sepals spreading and decurved, ovate, 1in. long, deep rose-coloured, with numerous red dots; tails 2in. to 3in. long, curved, the upper half yellow, the lower half green; lip and petals very small. This species is one of the most popular of all Masdevallias. It blossoms freely in spring, and remains in beauty several weeks. There are several forms of it, and the colours vary

somewhat from those here given. Syn. *M. Shuttleworthii.* (Fig. 94; B. M., t. 6372.)

M. Chestertoni (*Rchb. f.*).—One of the most distinct kinds of the *M. Chimæra* group, though differing very widely in the form and size of its flowers from *M. Chimæra.* The leaves are tufted, 5in. long, 1in. wide, broadest above the middle, pointed, channelled, scarcely stalked, pale dull green. The scapes are pendulous, 4in. long, with numerous sheaths, one-flowered. Flowers 2½in. across; sepals spreading, ovate, 1in. long, yellowish-green, with spots and streaks of purple, each having a tail-like appendage, 1in. long, curved at the point; petals very small, and club-shaped, yellow, with black tips; lip kidney-shaped, concave, ¾in. across, with red veins on a pale red ground. This species requires the same treatment as advised for the *M. Chimæra* section. Colombia, 1897. (B. M., t. 6971.)

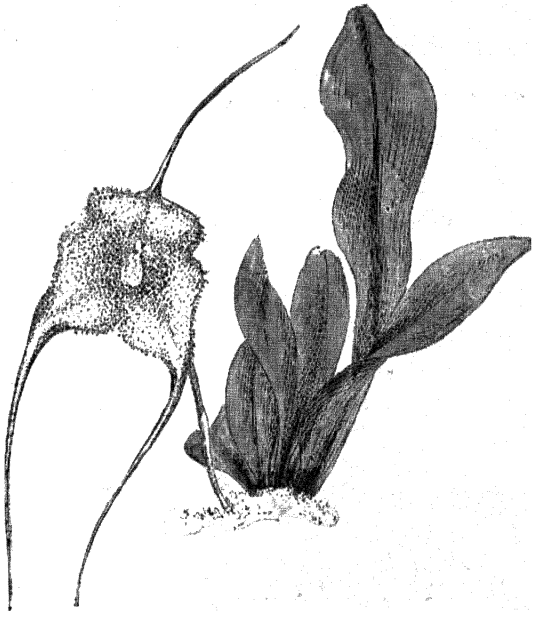


FIG. 95. MASDEVALLIA CHIMÆRA WALLISII (much reduced).

M. Chimæra (*Rchb. f.*).—One of the most wonderful of Orchids. Some would call its flowers ugly: none would deny the extraordinary character of their shapes and colours. "No name more applicable could be found for it than that of the offspring of Typhon and Echidna, which had the body of a goat, the head of a lion, and the tail of a dragon, and which vomited forth flames of fire" (Reichenbach). There are several other species very similar to it, and one or two of them are sometimes known as *M. Chimæra.* The true plant has leaves 9in. to 1ft. long,

Masdevallia.

1½in. broad, slightly channelled, dull green, the stalks springing from sheaths 1in. long. The flower-scape is curved, 6in. to 9in. long, sheathed at the nodes, one-flowered. Each flower is composed of three united, triangular sepals, spreading, slightly curved, each 1in. broad at the base, and forming a shallow cup, whence they gradually narrow to thin, straight tails, the whole sepal measuring about 6in. in length; the inner surface is covered with soft hairs, and is coloured creamy-yellow, with large spots and blotches of purple-brown. The petals are small, and the lip is a pouch with slightly-toothed edges, creamy-white. The flowers remain fresh several weeks. Sometimes a second, and even a third, flower is developed from the same scape if it is left on the plant. Colombia, 1872. (G. C., July, 1881, p. 113.)



FIG. 96. MASDEVALLIA COCCINEA (much reduced).

Var. *Backhouseana* is an exceedingly dark and a most distinct variety.

Var. *Wallisii* is similar to the type, but has shorter tails, and the flowers are lighter in colour. (Fig. 95.)

M. civilis (*Rchb. f.*).—Flowers greenish-yellow, spotted inside with brown; sepals fused into a tube, terminating in three slender tails. Leaves fleshy, 4in. to 6in. long. Peru, 1864. (B. M., t. 5476.)

M. coccinea (*Lind.*).—A bright-coloured species, the flowers being as red as a soldier's coat. It is said to be like *M. ignea*, but with larger flowers and stouter leaves. These latter are 5in. long, strap-shaped, rounded at the apex, stalk-like at the base, thick, fleshy, dark green. The flower-scapes are 1ft. high, one-

flowered; the tube is short, and curved; the upper sepal narrow, curved, horizontal, rose-tinted; the two lower sepals broad, joined at the base, somewhat falcate, narrowed to a long point, glowing scarlet. Colombia, 1868. (Fig. 96; G., t. 870.)

The whole of the varieties known in cultivation as belonging to *M. Harryana* (*Rchb. f.*) are now referred to this species.

M. conchiflora (*Hort.*).—A variety of *M. coccinea.*

M. coriacea (*Lindl.*).—An interesting species with fleshy flowers, whose lobes are greenish-yellow, dotted with crimson inside; petals white and crimson. Leaves linear-lanceolate, 6in. to 8in. long, with purplish dotted petioles; peduncles one-flowered, spotted, 6in. long. Colombia, 1872. Syn. *M. Bruchmülleri.*

M. cucullata (*Lindl.*).—A fine species, with glossy blackish-purple flowers, whitish inside at base; tips of tails yellow. Colombia, 1883.

M. Davisii (*Rchb. f.*).—A large-flowered, distinct species, with pretty canary-yellow flowers. The leaves are tufted, 8in. long, ¾in. wide, thick and leathery, blunt-pointed, with a distinct petiole, 2in. long, and sheathed at the base. Scapes erect, 1ft. long, one-flowered; sepals united at the base, and forming a narrow tube ¾in. long, then spreading, the upper one suddenly narrowed to a tail 1in. long, the lower pair 2½in. long, united about half-way down, forming a flat expansion 1½in. across, with tails ¼in. long; petals and lip almost hidden in the tube. This species usually blossoms in summer, and remains in beauty for several weeks. If grown under the conditions recommended for *M. coccinea*, it forms a large tuft, and flowers freely. Its colour is exceptional in the genus. Peru, 1875. (B. M., t. 6190.)

M. Dayana (*Rchb. f.*).—A synonym of *Cryptophoranthus Dayanus.*

M. demissa (*Rchb. f.*).—The flowers have the free lacinia of the upper sepal triangular, and very short; the tail is dark yellow; lateral sepals brownish-purple, connate, rounded outside, with two strong yellow tails; petals brown, small; lip brown, narrow, cordate-triangular, acute; column white; peduncle one-flowered, much shorter than the very thick, cuneate-spathulate leaves. Costa Rica, 1887.

M. Denisoniana (*Hort.*).—A variety of *M. coccinea.*

M. Ephippium (*Rchb. f.*).—A large-flowered species, quite distinct from the majority of cultivated kinds. The leaves are erect, fleshy, shining green, from 6in. to 9in. long, 1½in. wide, narrowed to a stalk 2in. long, blunt and recurved at the apex. The scape is erect, stout, angled, one-flowered; flowers 9in.

long, including the tails; upper sepal small, concave, round, yellow and brown, terminated by a long, reflexed, slender, yellow tail; lower sepals united, and forming a concave, bowl-shaped, ribbed body of irregular shape, 1in. across, deep rufous-brown, the tails joined at the base, and then curving away to a length of from 3in. to 5in. The plant blossoms in spring, and requires the treatment recommended for the *M. Chimæra* section, except that it thrives better in pots than in baskets. It is a very remarkable Orchid, almost equalling *M. Chimæra* in its fantastic shape. Introduced in 1873 from Colombia. Syn. *M. Trochilus.* (Fig. 97, for which we are indebted to the Editor of "The Garden"; B. M., t. 6208.)



FIG. 97. MASDEVALLIA EPHIPPIUM (much reduced).

M. erythrochæte (*Rchb. f.*).—A pretty and free-flowering plant of the *M. Chimæra* group. The leaves are erect, channelled, 9in. long, ¾in. wide, narrowed to a stalk-like base. The flower-scapes are usually horizontal, 4in. long, one-flowered, with numerous sheaths. The flowers are 1in. across, with triangular papillose sepals, almost flat, white, with yellowish spots, the apices lengthened into thin, dull red tails 2in. long; the petals are small, and the lip is narrow, saccate, and whitish. An easily-grown plant, which should be treated as recommended for the *M. Chimæra* section. It blossoms in summer, and remains in beauty a month or more. Central America, 1882. Syns. *M. astuta* and *M. Gaskelliana.*

M. Estradæ (*Rchb. f.*).—A small species, with grotesquely-formed and richly-coloured flowers. The leaves are in dense tufts, and are 3in. long, spoon-shaped, the blade being fleshy, flat, ¾in. across, keeled, bifid at the apex. The scapes are 4in. long, erect, one-flowered; flowers with a short, bent tube, from which the three equal sepals diverge, one upwards, the other two downwards; they are oval in shape, ½in. long, violet-purple in

Masdevallia.

the lower half, and white in the upper; the tails are 1½in. long, and yellow; the upper sepal is concave, and is blotched with yellow at the base. This free-flowering little plant requires similar treatment to *M. caudata*. It blossoms about April. Introduced in 1873, from Colombia, where its discoverer found it in cultivation in the Gardens of Donna Estrada. (B. M., t. 6171.)

M. Gaskelliana (*Rchb. f.*).—A synonym of *M. erythrochæte.*

M. gibberosa (*Rchb. f.*).—A synonym of *Scaphosepalum gibberosum.*

M. gracilenta (*Rchb. f.*).—A synonym of *Cryptophoranthus gracilentus.*

M. Harryana (*Rchb. f.*).—The plants in cultivation under this name are now recognised as varieties only of *M. coccinea.*

M. Hendersoni (*Hort.*).—This is a variety of *M. coccinea.*

M. hieroglyphica (*Rchb. f.*).—A distinct plant, with upper sepal erect, flat, and having three dark lines and numerous dark spots; lateral ones nearly square, marked with a dark purple-brown area, and the long tails suddenly bent down. Colombia, 1882.

M. Houtteana (*Rchb. f.*).—Flowers, sepals creamy-white, profusely spotted with blood-red, broad, each lengthened out into a thick, terete, red tail, and measuring from 2in. to 3in. long; scape one-flowered. July. Leaves 1ft. long, ¼in. broad. Colombia, 1874. Syn. *M. Benedicti.* (F. d. S., t. 2106.)

M. ignea (*Rchb. f.*).—A pretty, bright-flowered species, and one of the most popular. The leaves are semi-erect, 4in. to 6in. long, with an attenuated, stalk-like base, rounded at the apex, 1½in. across, fleshy, dark green. The scapes are 9in. to 12in. long, erect, one-flowered. Each flower has a short, curved tube, so that the sepals face horizontally; the upper one is narrow, tailed, decumbent, 1½in. long; the two lower ones are joined half-way down, broad-ovate, sharp-pointed, 1½in long, flat, 1½in. across the pair; colour orange or flame-red, with six broad, crimson lines. They are fleshy in substance, and remain fresh on the plant for about six weeks. This species should be grown as advised for the robust-growing species. It blossoms in spring. Colombia, 1870. (B. M., t. 5962.)

There are numerous named varieties of this, the best of them being: *aurantiaca*, flowers orange-yellow; *Boddaërti*, flowers rose-tinted, yellow on the under side; *Eckhautii*, flowers rich crimson; *Marshalliana*, flowers large, yellowish; *Massangeana*, flowers orange-scarlet, with crimson stripes, 2½in. across; and *Stobartiana*, flowers mauve-tinted.

Masdevallia.

M. infracta (*Lindl.*).—Flowers whitish, dotted with brown, and furnished with yellow tails. Brazil, 1835. (B. H., 1873, 22.)

M. Laucheana (*Hort.*).—An extremely pretty species, bearing white flowers with yellow tails and spathulate leaves. (Fig. 98.)

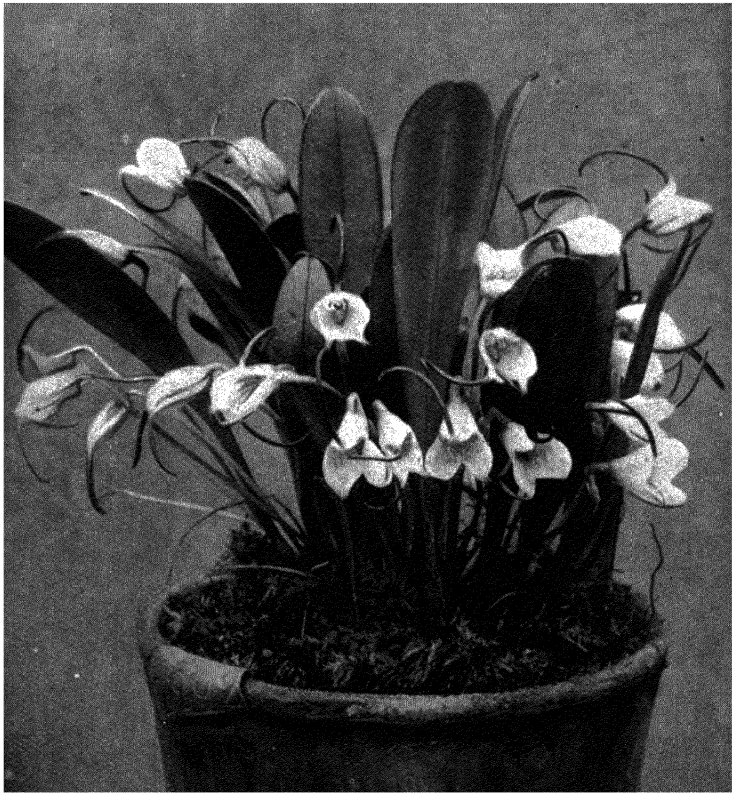


FIG. 98. MASDEVALLIA LAUCHEANA
(slightly reduced).

M. leontoglossa (*Rchb. f.*).—Flowers lemon and ochre, spotted with dark purple; lateral sepals united nearly to their apex; petals white, with two purple streaks; lip also white, with purple warts and blotches. Colombia, 1881.

Masdevallia.

M. Lindeni (*André*).—This is now considered a variety of *M. coccinea.*

M. Lowii (*Hort.*).—Closely allied to, if not absolutely identical with, *M. trinema*, and with the general habit of *M. Chimæra.* Flowers 3in. across; sepals lanceolate, acuminate, almost white,

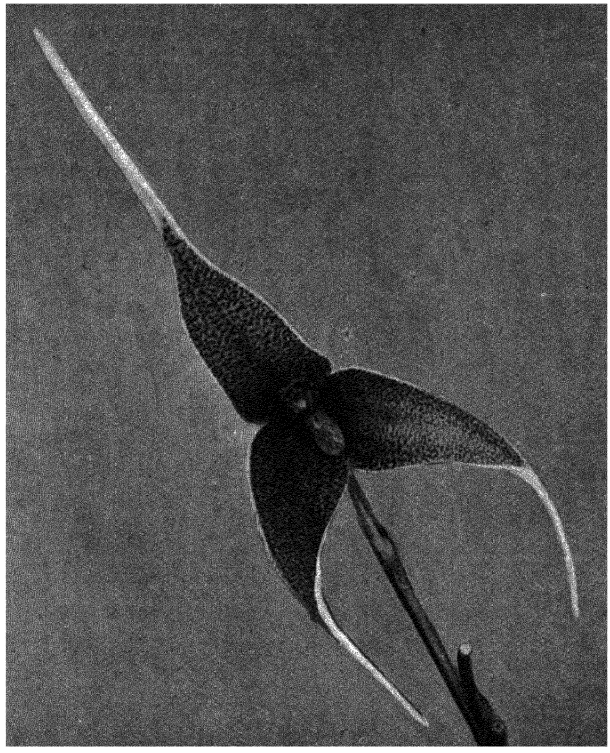


FIG. 99. FLOWER OF MASDEVALLIA LOWII (much reduced).

thickly spotted with purple; lip small, fleshy, maroon-purple. It should be treated like the *Chimæra* section. Colombia, 1890. (Fig. 99.)

M. macrura (*Rchb. f.*).—This robust, large-flowered plant is of exceptional form. The leaves are thick, fleshy, shining green, 9in. to 12in. long, 2in. wide, with a petiole 2in. long, widest

near the apex. The scapes are erect, as long as the leaves, one-flowered; the flowers are 9in. to 12in. in length, the sepals united at the base, and forming a broad, horizontal cup ½in. deep, then spreading vertically, the upper one 5in. long, gradually narrowed from a broad base, the lower ones free, narrow, tail-like, sometimes curved towards the tips, and from 4in. to 6in. long; petals and lip small; colour tawny-yellow, with numerous small, purple spots, the cup shaded with purple outside, paler inside. This free-growing plant should be grown in a pot under the conditions recommended for *M. Chimæra*. Colombia, 1876. (B. M., t. 7164.)

M. melanopus (*Rchb. f.*).—A densely-tufted, free-flowering plant. Leaves 6in. long, 1in. broad, strap-shaped, stalked at the base, sheathed. Scape 9in. long, erect, many-flowered; sepals pale lilac, spotted with purple, united at the base, the upper one largest, ½in. across, concave, keeled, with yellow tails ¾in. long; lower sepals free almost to the base, the margins recurved, ½in. long, fringed with soft hairs; tails yellow, ¾in. long; petals and lip very small. Although the individual flowers are rather small, they are bright in colour, and being numerous on the scapes as well as freely produced, they make a bright and attractive little picture every winter. The plant blossoms in January, and lasts in beauty over two months. Peru, 1874. Syn. *M. polysticta*. (B. M., t. 6258.)

M. melanoxantha (*Lind.* and *Rchb. f.*).—A synonym of *M. Mooreana*.

M. Mooreana (*Rchb. f.*).—Related to *M. macrura*, this large-flowered, stout-leaved species is sometimes met with under the name of *M. melanoxantha*. The leaves are 6in. to 8in. long, 1½in. wide, rounded at apex, stalked at base, with a distinct node and long brownish sheaths, fleshy, thick, dark green, spotted purple on the lower half. The scapes are erect, purplish, 4in. long, with a basal and middle sheath, one-flowered; flowers horizontal, cup-shaped, with a depression or chin, the cup nearly 1in. in depth and width; upper sepal narrowed to a twisted tail 2in. long; lower sepals joined for one third of their length, then free and tail-like; colour dull white, with purple speckles on the tube, and a large blotch of crimson-purple on the lower sepals; tails paler; petals white; lip oblong, hairy, dark purple. Venezuela, 1884. (B. M., t. 7015.)

M. muscosa (*Rchb. f.*).—As stated elsewhere this species is a very sensitive one as regards its lip, enclosing any unfortunate insect that may alight upon it. Flowers buff-yellow

reddish-nerved; petals with very peculiar dilated apices; lip deep violet, bearded; peduncles hispid, two-flowered. Colombia, 1875.

M. Nycterina (*Rchb. f.*).—For some time this very interesting species was cultivated as the true *M. Chimæra*, a much larger and showier plant. *M. Nycterina* has leaves about 6in. long, channelled, broad almost to the base, which is sheathed. The scape is pendent, or rests on the ground, 3in. long, one-flowered; the flowers are triangular in outline, the sepals being equal in size, joined by their lower edges, each narrowed to a point, from which springs a thin tail, 3in. long; the body of the flower measures 2in. by 1½in.; the inner surface is covered with soft hair; colour tawny-yellow, shaded with brown and thickly spotted with purple; the petals are small and pouched, with jagged edges, whitish. This plant should be grown along with *M. Chimæra*. Although smaller-flowered, it possesses all the curiosity of form and colour of that species. Colombia, 1873. (F. M., ser. ii., t. 150.)

M. polysticta (*Hook. f.*).—A synonym of *M. melanopus*.

M. racemosa (*Lindl.*).—When well grown this is an attractive species. The stems are creeping, longer than in any other kind. The leaves are 4in. long, spoon-shaped, with thin petioles, the blade being ¾in. across, fleshy, dark green. The flowers are borne on long, branching racemes, as many as twenty on a raceme being shown by a dried specimen; however, about six flowers on a raceme are the most yet produced by cultivated plants. They are erect, 1in. across; the tube is narrow, ¾in. long; the odd sepal is ½in. long, pointed; the pair of sepals is united almost to the base, the free portions curving outwards so as to form a wide, two-lobed blade; colour brilliant orange, with dark red lines. This species requires cool treatment all the year round, and should be grown on a raft or in a basket. Although described by Lindley as early as 1839, it was only introduced from Colombia in 1883 by Messrs. Shuttleworth and Carder. (G. C., 1884, p. 737.)

M. Reichenbachiana (*Endr.*).—Flowers 2in. long; the funnel-shaped tube and slender tails are whitish-yellow, with the back blood red. Leaves spathulate, narrowed towards the base, tridentate at apex. Costa Rica, 1875.

Var. *aurantiaca*.—This has rich orange lateral sepals instead of purple-brown ones.

M. Roezlii (*Rchb. f.*).—A variety of *M. Chimæra*.

M. rosea (*Lindl.*).—One of the prettiest of all Masdevallias, and when properly managed a most profuse flowerer. It has

semi-erect, spoon-shaped, dark green leaves, the blade being ovate, 2in. long, the stalk about the same length. The flowers are borne singly on thin scapes a little longer than the leaves, and have a narrow tube 1in. long; the narrow upper sepal almost rests on the lower sepals, which are joined near the base, and are ovate acute, tapering to tail-like points, a good variety being 2in. long by 1in. across the broadest part; lip and petals hidden in the tube; colour clear rose, with a tinge of purple. A plant in a 5in. pot, with no less than 120 expanded flowers upon it, was exhibited in 1886. This species requires the same treatment as *M. tovarensis*. It is a native of Peru, and was introduced in 1880, although known and described forty year before. (Belg. Hort., 1882, t. 3.)

M. Schlimii (*Lind.*).—A handsome species. Flowers yellow, mottled with brownish-red spots, the combined body of the two lower sepals produced much beyond that of the upper one, and somewhat pandurate in outline; tails yellow, 1in. long; scape three- to six-flowered, twice as long as the leaves. Leaves spathulate-elliptic, 6in. to 12in. long. Flowers in spring. Venezuela, 1884. This species should be grown under rather warmer conditions than the Odontoglossum-house affords during the winter. (B. M., t. 6740).

M. Schrœderiana (*Hort.*).—One of the most distinct and desirable Masdevallias. It should be grown in the intermediate-house during winter. Flowers of good size, the two lower divisions rather the larger, edged with deep puple, white in the centre; tails yellow, very long, recurved. Habitat not given; 1890.

M. senilis (*Rchb. f.*).—A variety of *M. Chimœra*.

M. Shuttleworthii (*Rchb. f.*).—A synonym of *M. caudata*.

M. simula (*Rchb. f.*).—Flowers purplish, honey-coloured in front, small; upper sepal purplish, with pellucid bars. The flowers are produced among the foliage, and resemble small partridges in colour, from which the species acquired the distinctive name in gardens of "Partridge in the Grass." Leaves linear-lanceolate. Colombia, 1875.

M. spectrum (*Rchb. f.*).—A variety of *M. Chimœra*.

M. swertiæfolia (*Rchb. f.*).—This is now regarded as *Scaphosepalum swertiæfolium*.

M. tovarensis (*Rchb. f.*).—The only white-flowered species, and one of the most popular in gardens. The leaves are erect, 5in. long, ¾in. across, thick, fleshy, shining green, very brittle, the base being narrowed to a stalk 2in. long, and inclosed in green sheaths. The scape is erect, two-edged, 5in. long, with a pair of

vase-shaped bracts at the top, from which spring the flowers, strong scapes bearing four each; tube short and curved; upper sepal narrow, tail-like, reflexed, 1½in. long; lower sepals united and forming a flat blade 1½in. long and 1in. across, with a pair of tails ¾in. long. The whole flower is pure snow-white, and is sweet-scented. The plant blossoms in winter, and continues in flower for two months or more. It is easily cultivated if planted in pots or pans, but requires more warmth in winter than the majority of Masdevallias. This species was the first introduced of the large, attractive-flowered kinds. In 1864, when it first flowered, there were scarcely half-a-dozen species in cultivation, and these were the most insignificant of those now known. It is a native of Tovar, in Colombia. Syn. *M. candida.* (B. M., t. 5505.)

M. triangularis (*Lindl.*).—A handsome species, and perhaps the most free-flowering of all Masdevallias. The leaves are tufted, 4in. long, ovate in the blade, stalked, dull green. The flower-scapes are erect, 6in. long, one-flowered; the sepals are triangular, slightly concave, spreading, the broad part being ¾in. and the tail 1in. long; colour light ochre, with numerous brown spots, clear at the base, the tails dull red; petals and lip very small. Although dull in colour, this is an elegant little plant, and well worth growing. It blooms in the spring, remaining in flower nearly two months. It may be grown as advised for *M. caudata.* Colombia, 1843.

M. triaristella (*Rchb. f.*).—One of the tiniest of Orchids, but a gem, and of far greater beauty and interest than many large and popular kinds. The leaves are erect, about 2in. long, very narrow, almost terete, with a short stalk, and crowded in a dense tuft. The scapes are erect, very thin and hair-like, 3in. long, one-flowered; the two lower sepals are deep brown-crimson, united so as to form a little boat ½in. long, with a pair of short horn-like yellow tails near the tip; the upper sepal is short, erect, with a yellow tail ½in. long; the tails are thickest at the apex. Costa Rica, 1876.

M. tridactylites (*Rchb. f.*), **M. triglochin** (*Rchb. f.*), and several other species, are similar to the preceding in the minuteness and beauty of their flowers, and the diminutiveness of the whole plant. All require the same treatment as the *M. caudata* group.

M. trinema (*Rchb. f.*).—This is practically identical with *M. Lowii.*

M. Trochilus (*André*).—A synonym of *M. Ephippium.*

M. Veitchiana (*Rchb. f.*).—The most brilliant in colour, and one of the largest-flowered of all Masdevallias. It is not

Masdevallia.

only one of the most beautiful, but the most singular of Orchids, for the vivid hue of the flowers is due to the whole inner surface of the sepals being covered with minute papillæ (raised dots) of the most brilliant colours. These are largest and most crowded where the colour is deepest. Leaves 6in. to 8in. long, 1in. wide, erect, broadest near the top, which is acute-pointed, the lower part narrowing to a partially-sheathed base. The scape is erect, 1ft. long, one-flowered, and the ovary curved; the sepals form a shallow cup, the upper one 2in. long, ovate, narrowed to a tail-like point, the lower pair 2in. long, united and forming a concave blade 1½in. across, then separated and narrowed to short tails; the petals and lip are very small; colour bright cinnabar-red, with a broad patch of purplish-violet on the inner surface of the lower sepals. The plant blossoms in autumn, sometimes also in spring, the flowers lasting a long time. It requires the same treatment as *M. coccinea*. Peru, 1867. (B. M., t. 5739.)

Var. *grandiflora* has flowers nearly twice as large as those of the type, and more finely coloured.

M. Wageneriana (*Lindl.*).—A small but pretty species, scarcely 3in. in height. Leaves in tufts, spoon-shaped, rather leathery. Flowers produced singly on decumbent wiry scapes, bearing a few small sheaths; sepals united at the base, forming a short, cup-like tube, the upper one concave, with a slender tail 1in. long, the lower ones spreading, their tails recurved; colour yellow, with a few red dots in the throat; petals minute, hatchet-shaped; lip small, toothed, with a claw-like apex. Like all the small plants of this genus, *M. Wageneriana* must be magnified to be seen to advantage. It thrives when treated similarly to *M. caudata*. Central America, 1851. (B. M., t. 4921.)

M. Wallisii (*Rchb.*).—A variety of *M. Chimæra*.

M. Wendlandii (*Rchb. f.*).—Perhaps the only tropical species. It should be grown in a warm, intermediate-house temperature always. Flowers white, tubular, solitary, ⅔in. long, the tails equal to the free, triangular bodies; chin short; lip having an orange area before the apex, and very numerous small dark purple dots; column white, with three mauve stripes. Leaves densely massed, spathulate, minutely bilobed. Colombia, 1887.

GARDEN HYBRIDS.

Acis	*abbreviata* and *Chelsoni* (Hincks).
Ajax	*Chelsoni* and *peristeria* (Veitch).
Amesiana	*Veitchiana* and *tovarensis* (Sander).
Asmodia	*Chelsoni* and *Reichenbachiana* (Veitch).
Bocking Hybrid	*Veitchiana* and *cucullata*.
Cassiope	*triangularis* and *coccinea* (Hincks).

Masdevallia.

caudata Estradæ	*Estradæ* and *caudata* (*Shuttleworthii*) (Veitch).
Chamberlainiana	*coccinea* and *caudata* (Chamberlain).
Chelsoni	*Veitchiana* and *amabilis* (Veitch).
Circe	*Veitchiana* and *Schræderiana* (Veitch).
Courtauldiana	*rosea* and *caudata* (Cookson).
Curlei	*macrura* and *tovarensis* (Curle).
Doris	*triangularis* and *racemosa Crossii* (Hincks).
Ellisiana	*coccinea* and *ignea* (Veitch).
falcata	*coccinea Lindeni* and *Veitchiana* (Drewett).
Fraseri	*ignea* and *coccinea Lindeni* (Fraser).
Gairiana	*Davisii* and *Veitchiana* (Veitch).
Geleniana	*caudata* and *xanthina* (Sander).
glaphyrantha	*infracta* and *Barlæana* (Veitch).
Heathii	*ignea rubescens* and *Veitchiana* (Heath).
Hebe	*coriacea* and *Veitchiana grandiflora* (Hincks).
Henrietta	*ignea rubescens* and *caudata* (Ames).
Hincksiana	*tovarensis* and *ignea* (Hincks).
igneo-Chelsoni	*ignea* and *Chelsoni* (Ames).
Imogen	*Schlimii* and *Veitchiana* (Veitch).
Jessie Winn	*tovarensis* and *Davisii* (Winn).
Kimballiana	*Veitchiana* and *caudata* (Sander).
Leda	*Estradæ* and *Arminii* (Hincks).
Mary Ames	*ignea* and *Gairiana* (Ames).
McVittæ	*tovarensis* and *Veitchiana* (Stevens).
Measuresiana	*tovarensis* and *amabilis* (Sander).
Mundyana	Syn. *Heathii* (Sander).
Parlatoreana	*Barlæana* and *Veitchiana* (Veitch).
Pluto	*Gairiana* and *coccinea* (Hincks).
Pourbaixii	*Veitchiana* and *caudata* (Linden).
Rebecca	*ignea rubescens* and *caudata* (Ames).
Rushtonii	*ignea Echartii* and *racemosa Crossii* (Hincks).
Shuttryana	*caudata* and *coccinea* (Lawrence).
splendida	*Barlæana* and *Veitchiana* (Veitch and nat. hyb.).
Stella	*Estradæ* and *coccinea* (Hincks).
Veitchiano-Estradæ	*Veitchiana* and *Estradæ* (Hincks).

MAXILLARIA.

Originally described by Ruiz and Pavon, this genus takes its name from a certain resemblance traced by its authors between the column and lip of the blossoms and the maxillæ, or jaws, of insects. It belongs to the tribe *Vandeæ*. Many of the species of *Lycaste* were originally described as Maxillarias, and the genus as now understood includes *Dicrypta*.

Culture.—From a cultural point of view it may be said that few Orchids are easier to grow than Maxillarias. All the species except *M. Sanderiana* thrive best when treated as pot-plants, using for them a compost consisting of good fibrous peat and chopped sphagnum in about equal parts. During the growing season they require a liberal supply of

water; but in the resting season, less water should be given. They may be grown in the same house as *Odontoglossum crispum*, but in winter the temperature should not be allowed to fall below 50deg. If kept in a warm house, the leaves soon become badly spotted—a sure indication that the temperature is too high. The air about the plants should be fresh, and the light good, although they do not like bright sunshine.

The species described here are sufficiently ornamental to find a place in every collection, however limited the space at command. The majority of them blossom profusely, large quantities of flowers being produced on even moderate-sized plants.

M. atropurpurea (*Lindl.*).—A synonym of *Bifrenaria atropurpurea.*

M. Brocklehurstiana (*Lindl.*).—A synonym of *Houlletia Brocklehurstiana.*

M. grandiflora (*Lindl.*).—A handsome-flowered, large-leaved plant, deliciously fragrant. It has ovate compressed pseudo-bulbs, which are one-leaved. Leaves from 9in. to 12in. long, broadly strap-shaped, dark green, recurved. The scape is erect, 6in. long, one-flowered. The flowers are 4in. across, milk-white; sepals ovate, spreading; petals shorter; lip three-lobed, pouched, similar to that of *M. venusta*, but without the purple on the front lobe, which is yellow and powdered. The plant blossoms in autumn and winter, and lasts a long time in flower. Peru about 1850. (F. M., ser. ii., t. 322.)

M. Harrisoniæ (*Lindl.*).—A synonym of *Bifrenaria Harrisoniæ.*

M. luteo-alba (*Lindl.*).—An easily cultivated, very robust, and free-flowering species. Pseudo-bulbs 2½in. long, ovate, compressed, one-leaved. Leaves broad, blunt-pointed, dark green, 1½ft. long, the base narrowed and stalk-like. The scapes spring from the base of the pseudo-bulbs, and are 6in. long, clothed with sheathing bracts, one-flowered; each flower is 6in. across; the sepals are 3in. long, brown at the back, nearly ½in. wide, tawny-yellow except at the base, which is creamy-white, the upper one erect, the lower ones drooping and suggestive of the ears of a lop rabbit; the petals are erect, pointed forwards, half as long as the sepals, white at the base, then brown, yellow above; the lip is three-lobed, the side lobes being erect, yellow, with purple stripes, the middle lobe recurved, hairy, yellow, with white margins. This plant is

Maxillaria.

worth a place where fine specimens are wanted, as it soon fills a large pan, and is ornamental even when not in flower, whilst when in blossom it has a singular and attractive appearance. Colombia, 1846. (W. O. A., t. 106.)

M. nigrescens (*Lindl.*).—This is a useful, free-flowering species, deserving to be grown on account of the colour of its flowers, which is a deep vinous-red throughout, shaded with dull purple; the blossoms are about 2in. across, and are borne on erect scapes, 4in. long. The pseudo-bulbs are oval, compressed, blackish. The leaves are strap-shaped, acute at the tips, 1ft. long, 1½in. broad. The plant thrives under intermediate-house treatment. Colombia, 1849.

M. picta (*Lindl.*).—An old, easily-grown species that blossoms so profusely that many scores of flowers may be found on quite a small plant. The pseudo-bulbs are ovate, compressed, one- or two-leaved. The leaves are strap-shaped, acute-pointed, 8in. to 12in. long. The flowers are 2in. across, of a soft creamy-yellow externally, and of a rich deep orange within, streaked and dotted with dull purple and chocolate; they are produced singly, upon numerous basal scapes, from 3in. to 6in. high. The petals are curiously incurved. The lip is white, spotted with purple, and the column is wholly purple. The plant is a native of the Organ Mountains of Brazil, whence it was introduced in 1832; its blossoms are produced during winter. It should be grown in the intermediate-house. (B. M., t. 3154.)

M. Sanderiana (*Rchb. f.*).—Of all Maxillarias this is the most beautiful, and bears some resemblance to a fine variety of *Lycaste Skinneri*. It has ovate, compressed pseudo-bulbs, and oblong, acute-pointed, bright green leaves, 9in. long. The scape is decumbent, one-flowered, each flower measuring 5in. across; sepals 2in. broad, ovate, spreading, the upper one concave; petals shorter, semi-erect; lip three-lobed, the middle lobe concave, forming a cup with the column and side lobes; the edges are wavy. The flowers are white, the base of the lip and segments being deep crimson, with a few large spots of the same colour scattered over the petals. This species, introduced from Peru in 1884, was seen in flower for the first time at the Orchid Conference, held at South Kensington in 1885, and it was certainly the most attractive new Orchid exhibited there. It should be treated as advised for the other species, but thrives best planted in a teak basket. (G., 1887, t. 606.)

M. venusta (*Rchb. f.*).—A large-flowered, charming plant, not unlike *M. grandiflora*, but more robust. The pseudo-bulbs

Maxillaria.

are ovate, compressed; each bears one leaf, which is broad-oblong, recurved, acute-pointed, 1ft. in length, light shining green. The scapes are 6in. long, curved upwards, clothed with reddish bracts, one-flowered; flower nodding, 6in. across; sepals broad at the base, gradually narrowed to a point, the upper one concave, the two lateral ones undulated and somewhat curved, 3in. long; petals shorter than, but similar in shape to, the lateral sepal; lip three-lobed, the middle lobe recurved, triangular, yellow, with a fleshy disk and a pair of crimson spots; side lobes reddish on the margins; the rest of the flower is pure glistening white. The plant blossoms in winter or spring, the flowers lasting about a month. Native of Colombia at 6,000ft. elevation, whence it was introduced in 1812. (B. M., t. 5296.)

Many more species of *Maxillaria* are in cultivation, but the majority of these are of botanical interest only. Most of the species will be found described in Nicholson's "Dictionary of Gardening."

MEGACLINIUM.

Several interesting Orchids belonging to the tribe *Epidendreæ* are found in this genus. The name, given by Lindley, is from *megas*, large, and *kline*, a bed; referring to the axis or rachis on which the flowers are borne. The species (which are natives of Southern sub-tropical Africa) are epiphytal, and require the temperature of the intermediate-house. The cultural requirements are similar to those for *Bulbophyllum*. Outside botanic gardens they are rarely cultivated.

MESOSPINIDIUM (*Rchb. f.*). This genus is now merged with **Cochlioda** and **Odontoglossum.**

MICROSTYLIS.

Of the forty species of *Microstylis* (*Nutt.*), of the tribe *Epidendreæ*, about half-a-dozen are cultivated for their richly-coloured foliage. The name is from *micros*, small, and *stylos*, a column; in allusion to the size of the column. The culture is similar to that for *Anœctochilus*. The species are terrestrial, and natives of Europe, Asia, and America; they are closely related to our *Malaxis paludosa*. The pseudo-bulbs are fleshy, and they perish

Microstylis.

a year after maturity, after the manner of *Calanthe vestita*. The leaves are plaited, thin, and succulent, and their folding bases inclose the pseudo-bulbs. The flowers are small, purple or yellow, and are produced on erect spikes.

M. calophylla (*Rchb. f.*).—This is a prettily-variegated plant. The leaves are 3in. long, ovate, narrowed to a point at the apex, pale yellow-green, with a central patch of a shade of brown that



FIG. 100. MICROSTYLIS CHLOROPHRYS
(¾ nat. size).

is very near burnt-sienna, and numerous transverse lines of this colour amongst the yellow. The flowers are yellow. Malaya, 1877.

M. chlorophrys (*Rchb. f.*).—In this species the leaves are 4in. long, 2in. broad, narrowed to a point, wavy at the margins, the stems and lower part of the leaves being purplish; the leaf-blade is shining sepia-brown, with a marginal band of grey-green ½in. wide. Flowers purple. A well-grown plant of this, when

Microstylis.

bearing its erect spikes of glistening flowers, is a pretty little picture. Borneo, 1881. (Fig. 100.)

M. discolor (*Lindl.*).—Sir W. Hooker described this as the most lovely of terrestrial Orchids. The stems are clustered, 2in. long, green, inclosed in the sheathing bases of the leaves. The leaves are 4in. long, ovate, plaited, deep shining crimson-purple, the margins being pale green and very wavy. The flowers are yellow. Grown along with Anœctochili this plant thrives well, and is a pretty object. Ceylon, 1862. (B. M., t. 5403.)

M. metallica (*Rchb. f.*).—A charming little plant, easily kept in health, and almost always attractive. It is, as the late Professor Reichenbach called it, quite a gem. A cylindrical bulb bears leaves of an oblong, acute shape, 2in. long, 1in. wide, six in number. They are rosy-crimson beneath, and blackish-purple above, with quite an exquisite metallic lustre. The flowers are small, purplish in colour. Borneo, 1879. (B. M., t. 6668.)

MILTONIA.

Not more than a dozen well-marked species are comprised in this genus, of the tribe *Vandeæ*, founded by Lindley. All of them show considerable variation in the size and colouring of the flowers. Most of them are in cultivation, as they are easy to grow, and, with scarcely an exception, bear large and handsome flowers. All are natives of Brazil, except *M. Warscewiczii*, *M. vexillaria*, *M. Phalænopsis*, and *M. Roezlii*, which are natives of Colombia. The genus was named in compliment to Lord Fitzwilliam (Viscount Milton), who, more than half a century ago, had one of the best collections of Orchids then known.

Miltonias are related to Odontoglossums. They either have long, stout, creeping rhizomes, upon which the pseudo-bulbs occur about 1in. apart, or the pseudo-bulbs are clustered. The leaves vary in number from four to eight, all except two springing from the bottom of the pseudo-bulb, their sheathing bases inclosing it when young. There are generally two leaves on the apex of the pseudo-bulb, and these are strap-shaped or linear, smooth, shining green, the keel on the under side being prominent. As a rule, the leaves, when they are two years old, fall away from the pseudo-bulbs. The flowers are borne on scapes that spring from the base of the last-matured

Miltonia.

pseudo-bulbs, and each scape bears one or more flowers; the petals and sepals are usually similar in form and size, spreading; the lip is large, generally flat and broad, suddenly narrowed at the base to a short, thick neck; the disk on the front of the labellum is formed of several prominent ridges; the column is short, and usually winged.

Culture.—All the species are epiphytes; they therefore require an open fibrous peat, broken into small lumps, with most of the fine particles beaten out. Some thrive when planted in well-drained pots or pans; others are healthiest when grown in shallow teak baskets. All require liberal supplies of water at the roots when growing, and sufficient when dormant to keep the pseudo-bulbs in a plump state. As the details of culture for most of the species differ somewhat, it will be best to give particulars along with each kind. Vaporising at regular intervals is desirable to prevent the plants from being infested with thrips. Miltonias are easily propagated by division, as the rhizomes branch freely, and develop plenty of roots from the under side. The most favourable time for re-potting and dividing them is when the new roots make their appearance.

The leaves and pseudo-bulbs of some of the Miltonias are normally pale yellowish-green in colour, old parts of the plants being almost wholly yellow. Some beginners imagine that ill-health is the cause of this, but it is the natural colour, and cannot be altered, except at the expense of flowers. Miltonias like plenty of light, though not direct sunlight, and they flower only when well ripened.

M. candida (*Lindl.*).—A strong, large-leaved species, very free-flowering under ordinary treatment. The pseudo-bulbs are clustered, ovate, only slightly compressed, narrowed towards the top, 3in. or more long, with a pair of apical leaves 1ft. in length and 1½in. wide; the basal leaves are shorter, with broad sheaths. Scape erect, 1ft. or more long, bearing six to eight flowers, each 2½in. across; petals and sepals spreading, red-brown, with a few yellow bars and spots; lip scoop-shaped, wavy at the margin, pure white, afterwards turning to creamy-yellow. The plant blossoms in autumn, the flowers remaining fresh for a month or more. Brazil, 1830. (P. M. B., vi. 241.)

Miltonia.

M. candida should be planted in a pot or a pan, using a compost of two parts peat-fibre to one part sphagnum, and two-thirds filling the pot with crocks. Press the soil firmly about the roots, and keep it moist, when growth is vigorous. It requires intermediate-house treatment.

M. Clowesii (*Lindl.*).—In habit and form of flower this strong-growing species is similar to *M. candida*, while in pseudo-bulbs and foliage the two species are almost identical. Scape erect, many flowered, each flower nearly 3in. across; sepals and petals chestnut-brown, with a few yellowish blotches; lip heart-shaped, slightly constricted in the middle, pointed at the apex, with a conspicuous crest, the colour being vinous-purple in the lower part, and pure white in the rest. This species blossoms in September or October, or even as late as December, the flowers lasting a month or more. It requires similar culture to *M. candida*. Brazil, 1839. (B. M., t. 4109.)

M. cuneata (*Lindl.*).—This robust, free-flowering plant is larger in all its parts than most of the Miltonias, and exceptional also in having dark green foliage. The pseudo-bulbs are clustered, ovate, 4in. long, slightly compressed, smooth, sheathed in leaves at the base, and each bearing on the apex a pair of stout, strap-shaped leaves 1ft. long and 1½in. broad. The scape is erect, about 1ft. long, and bears from four to eight flowers; these are from 3in. to 4in. across; sepals and petals undulated, narrowed from the middle to an acute, reflexed point, and coloured chocolate-brown, with a few bars of yellowish-green, the tips being wholly of the latter colour; lip 1½in. long, 1in. wide, wavy, creamy-white, the crest composed of two parallel ridges, which are spotted with rose-purple; column large, winged, creamy-white. The blossoms expand in February, and remain fresh more than a month. This species thrives best when planted in a pot or a pan, in a compost of peat-fibre and sphagnum, and placed in the intermediate-house. It likes plenty of light and moisture. Brazil, 1843. (B. R., 1845, t. 8.)

M. Moreliana (*Hort.*).—Although usually called a variety of *M. spectabilis*, this fine Orchid is sufficiently distinct in colour alone to deserve to rank as a species. It has ovate, much-flattened pseudo-bulbs from 2in. to 3in. long, shining apple-green in colour, becoming bright yellow when old, and bearing two short, strap-shaped leaves, rarely more than 6in. long, with several shorter basal ones. The rhizome is stout, and creeps along the surface of the soil; the pseudo-bulbs are developed about 1½in. apart. The scape is erect, 6in. long, clothed with sheathing bracts 1½in. long, and bears a single flower, from 2in. to 4½in. across; sepals and petals 1in. to 2in. long, deep vinous-purple; lip 1in. to 2in. long,

nearly as broad, spreading, purple, lighter in colour than the other parts of the flower, and veined with deep purple. The flowers expand in October or November, and remain fresh at least six weeks. This is one of the most beautiful of all Orchids. The flowers vary in size and colour; the largest measurements here given are from a very fine specimen at Kew. It requires the same treatment as *M. spectabilis*. Brazil, 1846. (B. M., t. 4425.)



FIG. 101. MILTONIA ROEZLII

(much reduced).

M. Phalænopsis (*Nichols.*).—When well grown this is a delightful Orchid. The pseudo-bulbs are clustered, ovate, only slightly compressed, about 1in. long, when young sheathed in the bases of the lower leaves, with a pair of leaves on the apex. The leaves are narrow and grass-like, from 8in. to 12in. long, pale green. The scapes are erect, nearly as long as the leaves, each bearing from two to four flat flowers; sepals 1in. long, oblong, pointed; petals broader and rounded—both pure white; lip large, flat, 1in. across at the base, nearly as broad again at the apex, where it is divided into two spreading lobes, white, blotched and streaked with crimson towards the middle. This plant blossoms in spring or

summer, and remains in beauty about a month. It requires the treatment recommended for *M. Roezlii.* Specimens 1ft. across, bearing a score or more of large flowers and the graceful grass-like foliage mingled with them, are most beautiful objects. It was introduced in 1850 from Colombia, where it is said to carpet rocks at an elevation of 16,000ft. Syn. *Odontoglossum Phalænopsis.* (W. S. O., t. 30.)

M. Regnelli (*Rchb. f.*).—In habit and foliage this species resembles *M. candida.* It has narrow, flattened pseudo-bulbs. Leaves 1in. broad, bright green. Scapes erect, each bearing several flowers, over 2in. across; sepals and petals spreading, recurved at the apex, white; lip almost as wide as long, with a three-ridged, yellow crest, the rest being rosy-purple, with deeper-coloured veins. The blossoms appear in September, and remain fresh for a month or more. The plant should be treated as recommended for *M. cuneata.* Brazil, 1855. (B. M., t. 5436.)

M. Roezlii (*Nichols.*).—This beautiful species is closely related to *M. vexillaria,* differing chiefly in colour. The pseudo-bulbs are clustered, somewhat compressed, ovate, 1in. to 2in. long, inclosed in the sheathing bases of the lower leaves, and bearing at the apex only one leaf. The leaves are 1ft. long, ¾in. wide, acute-pointed, thin in texture, and pale green. The scapes are erect, and bear from two to four flowers, each of which is 3in. wide, flat and pansy-like; sepals and petals 1in. in length, oblong, pointed, pure white, with a large purple blotch at the base of each petal; lip two-lobed, broadest at the apex, where it is 2in. wide, pure white, with a tinge of yellow and purple near the crest. This species blossoms generally twice a year—in spring and in winter—the flowers remaining fresh for about five weeks. Its cultivation is not easy. It thrives best when grown in a moist, tropical-house, where it is suspended near the roof-glass, and shaded from bright sunshine. Fine specimens are grown in a house devoted to *Phalænopsis.* It should be potted in peat-fibre one part, and sphagnum two parts, using pans or small pots. Plenty of water must be given at all times. Thrips and red spider are its greatest enemies, destroying the leaves in a very short time if once they get established upon the plants. Dipping the plants about every fortnight, or vapourising at regular intervals, will keep the pest under. Colombia, 1873. Syn. *Odontoglossum Roezlii* (Fig. 101; B. M., t. 6085.)

Var. *album* has no purple in the flowers.

Var. *rubrum* has more purple on the lip than the type.

M. Schrœderiana (*O'Brien*).—Flowers fragrant, 2½in. across; sepals and petals chestnut-brown, tipped and marked with light

yellow, with revolute margins; lip rose-purple at base, milk-white at apex, subpandurate; scapes erect, racemose, seven- to nine-flowered. Leaves linear-oblong, 5in. to 7in. long. Pseudo-bulbs ovoid-oblong, two-leaved. Costa Rica, 1889. The flowers are borne in September. Syn. *Odontoglossum Schrœderianum.*

M. spectabilis (*Lindl.*).—The first-introduced species, and still one of the best, some of the varieties being exceptionally beautiful. The rhizomes are stout; the pseudo-bulbs are 1in. apart, oblong, very flat, 1in. to 3in. long, yellowish, inclosed in the sheathing basal leaves when young, and bearing at the apex a pair of pale apple-green, oblong leaves, varying in length from 4in. to 12in. Scapes erect, covered with sheaths, 6in. to 8in. long, one-flowered; flowers 4in. across; sepals and petals 2in. long, ¾in. broad, pure white, becoming cream-coloured before fading; lip 2in. long, and nearly as broad, spreading, rose-purple, almost crimson, the veins being darker in colour; crest of three short, projecting ridges. This plant blossoms in autumn, and remains in perfection for a month or more. There is considerable variation in the size and colour of the flowers, some being much superior to others, although the poorest plant is a good Orchid. Brazil, 1835. (Fig. 102; B. M., t. 4204.)

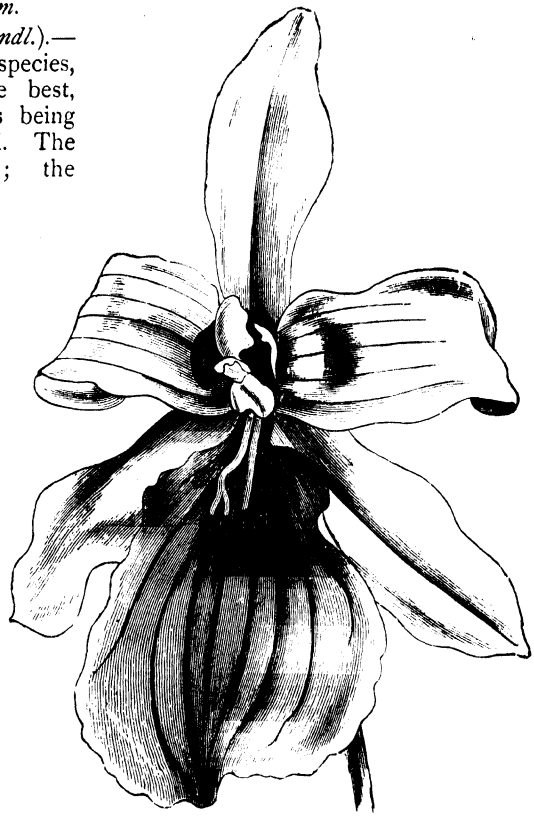


FIG. 102. FLOWER OF MILTONIA SPECTABILIS (nat. size).

Miltonia.

Var. *bicolor* has white and rosy-purple flowers.

Var. *radians* has the habit and flowers of the type, but the lip is white, with lines of purple radiating from the crest.

Var. *rosea* has narrower, longer pseudo-bulbs, and rose-tinted sepals and petals; the lip is banded with rose.



FIG. 103. MILTONIA VEXILLARIA
(much reduced).

Var. *virginalis* is distinguished by its tall scapes, its large flowers, and the deep crimson of its lip.

M. spectabilis and its varieties should be grown in a shallow teak basket, and require only a thin layer of compost about their roots. The soil should be peat-fibre, leaf-soil, and sphagnum.



FIG. 104. MILTONIA VEXILLARIA HOUSE IN JUNE.

Miltonia.

A position near the glass in an intermediate-house, or where Cattleyas are grown, is the most suitable, but it must be shaded from bright sunshine. Water must be freely given in the growing season, only sufficient being required while the plants are at rest to keep the pseudo-bulbs in a plump condition. Whilst in flower the plants may be removed to a cool house.

M. vexillaria (*Benth.*).—One of the most popular of all Orchids, and most easily managed. The pseudo-bulbs are narrowly-oblong, and about 2in. long, bearing narrow-lanceolate, pale green leaves from 9in. to 12in. long. The scapes are longer than the foliage, and bear from three to seven very large flowers, measuring 4in. in diameter; the sepals and petals are small, bright rose-coloured; the labellum is large and flat, deeply bilobed in front, rich rose, whitish at the base, streaked with yellow and red; the colour and shape of the flowers vary considerably in different plants. The blossoms are produced during spring and early summer. Syn. *Odontoglossum vexillarium.* (Figs. 103 and 104; B. M., t. 6037.)

Var. *Hilliana* is distinguished by its purple-spotted and rosy-margined lip.

Var. *leucoglossa* is remarkable for its white lip.

Var. *Memoria G. D. Owen*, a most distinct variety of the *M. v. superba* group, the rich marone-purple disk resembling a moth in shape. It is a rare plant, and at present only in Sir Frederick Wigan's collection at Clare Lawn, East Sheen.

Var. *rubella* (*Klabochorum*) has flowers smaller than those of the type, bright rose-coloured, produced in autumn. The pseudo-bulbs and leaves also are smaller.

Var. *superba* is a dark-coloured form, the lip being almost crimson, with three broad rays of white.

There are numerous other named varieties of this species, but we need not include them here.

M. vexillaria thrives best when grown in the cool intermediate-house, but during hot weather the Odontoglossum-house will suit it. The plants should be potted in good peat-fibre and sphagnum, well drained; they should be elevated well above the pot, and be watered freely when growing, but immediately after the flowers are over the plants should be removed to a cool, airy house, and water should be withheld for some weeks. Thrips are their greatest enemy, and to keep these under, the plants should be carefully examined every week or so, and cleaned if necessary. Although now well established in gardens here, the introduction of this splendid species was attended with much difficulty. It was originally discovered by the late Mr. Bowman, on the western slope of the Andes, and was subsequently found by Wallis and Roezl. Some of

Miltonia.

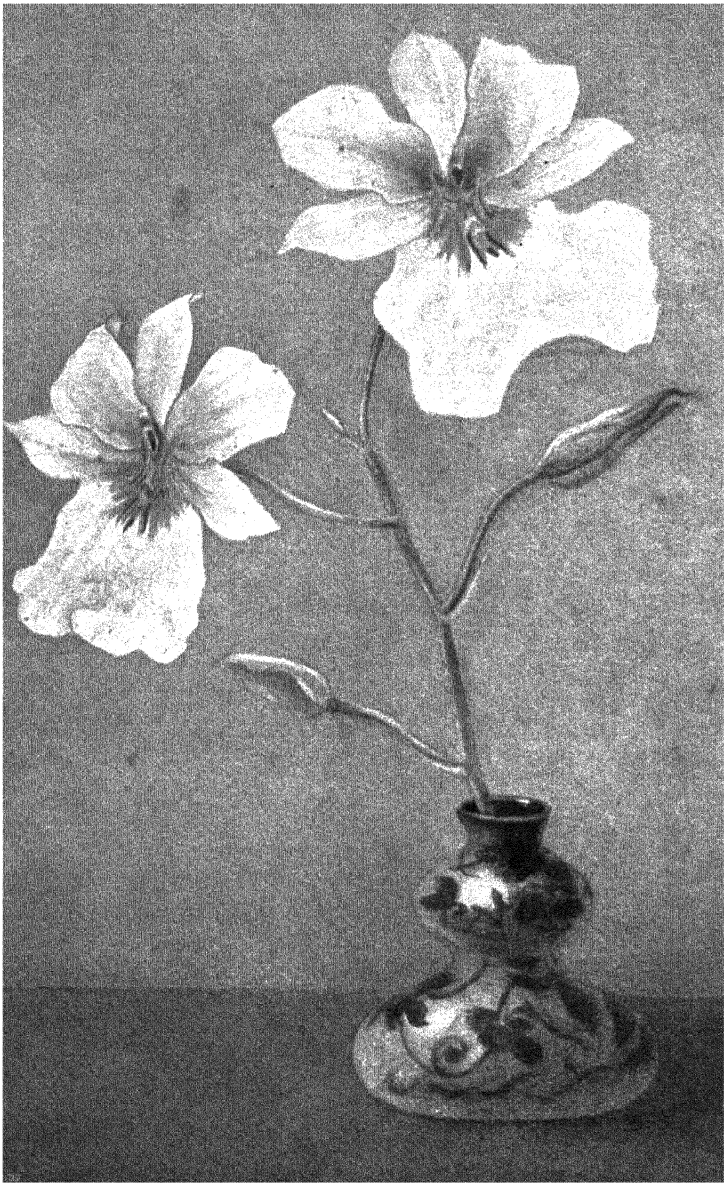
the plants were sent to M. Linden, who, however, failed to keep them alive. Living specimens were soon afterwards brought to England by Mr. Chesterton, and established in Messrs. Veitch's collection. Mr. Bull was also successful in the early days of its introduction. The original description by Professor Reichenbach, in the "Gardeners' Chronicle" for 1867, amusingly records the secrecy with which this plant was guarded on its introduction to



FIG. 105. FLOWERS OF MILTONIA WARSCEWICZII (nat. size).

Europe. He says that the flower from which the description was drawn up was borrowed for him by a friend, "after having given his promise (1) not to show it to anybody else, (2) not to speak much about it, (3) not to take a drawing, (4) not to have a photograph made, (5) not to look oftener than three times at it!"

M. Warscewiczii (*Rchb. f.*).—This extraordinary plant differs from most Miltonias in its many-flowered, branching scapes, and in the fantastic colours of its flowers. The pseudo-bulbs are



MILTONIA BLEUANA.

Miltonia.

clustered, erect, 5in. long, 1in. broad, much flattened, green, usually with only one apical leaf, and several others springing from the base. Leaves strap-shaped, 6in. to 9in. long, 1½in. broad, bright green. Scape wiry, arching, varying in length according to the strength of the plant, strong pseudo-bulbs producing tall, loose-branching panicles of thirty or forty flowers, each flower 2in. across; sepals and petals recurved at the margins towards the base, wavy reddish-brown, with yellow tips; lip almost circular, two-lobed, the margins curved back so as to give the front a rounded appearance; colour rose-purple, with a central blotch of yellowish-brown, and a broad, marginal band of white. It blossoms freely in summer or autumn, the flowers remaining fresh for several weeks. It should be grown along with, and be treated as advised for, *M. candida*. Peru, 1868. Syn. *Oncidium fuscatum*. (Fig. 105; B. M., t. 5843.)

GARDEN HYBRID.

Bleuana *vexillaria* and *Roezlii* (Bleu and Veitch).

NATURAL HYBRIDS.

Binoti *candida* and *Regnelli*.
Bluntii *spectabilis* and *Clowesii*.
Castanæ *Clowesii* and *Regnelli*.
Cobbiana *candida* and *cuneata*.
Cogniauxiæ *Moreliana* and *Regnelli*.
Lamarckeana *candida* and *Clowesii*.
leucoglossa..... *spectabilis* and *candida*.
Peetersiana *Regnelli* and *Moreliana*.

MONACHANTHUS (*Lindl.*). Now included under **Catasetum.**

MONOCHILUS (*Wall.*). Now included under **Zeuxine.**

MOOREA.

Mr. R. A. Rolfe describes this genus in the "Gardeners' Chronicle" in 1890, from a plant that flowered in the Royal Botanic Gardens at Glasnevin, and that had been introduced by Messrs. Shuttleworth and Carder, probably from Peru. It belongs to the tribe *Vandeæ*, and is named in compliment to Mr. F. W. Moore, Curator at Glasnevin. Its nearest ally is *Houlletia*, from which it differs "in the lip being without a claw, and articulated with the base or foot of the column, and by the upper part of the lip not

Moorea.

being articulated with the lower part." The treatment for this plant is similar to that recommended for *Houlletia.*

M. irrorata (*Rolfe*).—Pseudo-bulbs egg-shaped, 3in. long, two-leaved. Leaves broad, plicate, lanceolate, 1½ft. to 2ft. long. Scapes nearly 2ft. long, erect, stout, bearing eight flowers each 2in. in diameter, with spreading, oblong, pointed segments, coloured red-brown, paler at the base; lip three-lobed, the side lobes being rounded, the front lobe stalked, trowel-shaped, coloured straw-yellow, with dark purple radiating lines; column long, wingless, creamy-white. It flowers in December. (B. M., t. 7262.)

MORMODES.

A genus of remarkable and interesting plants, some of which also possess great beauty. It belongs to the tribe *Vandeæ*. The name was bestowed by Lindley, and is from *mormo*, a goblin; referring to the strange appearance of the flowers. It is nearly related to *Catasetum*, and differs chiefly in not having horns attached to the column. The plants are deciduous, losing their leaves in the late autumn. The pseudo-bulbs are stem-like, and taper towards the top, the older ones being clothed with the basal portions of the fallen leaves. The leaves are lance-shaped, plaited, about five or six in number, and are strengthened by several longitudinal ribs. The flowers are produced on thick, fleshy scapes originating in the nodes on various parts of the pseudo-bulbs; they are chiefly remarkable for the curiously-twisted column and lip, the latter being much incurved, and contracting at the base into a claw. The species are all epiphytal, and are natives of Central America and Mexico.

Culture.—Mormodes may be grown in pots of peat-fibre and sphagnum, and during summer they should occupy the lightest position in the warm-house. If, as is necessary, the pots are half-filled with drainage, the roots should receive copious supplies of water when growth has well commenced. Care must be observed, however, at the earliest stages. At that time, the back pseudo-bulbs furnish an adequate supply of nourishment to the young growths, and a superabundance of moisture is apt to cause decay. At no period must water be allowed to lodge in the centres of the growths. As growth ceases, a cooler and drier treatment is necessary to ripen the bulbs; the plants may then be placed on a shelf in the

Mormodes.

Cattleya-house, only sufficient water being given to prevent shrivelling.

M. luxata (*Lindl.*).—This species and its varieties are the handsomest representatives of the genus as yet known in cultivation. The pseudo-bulbs are 4in. to 6in. high, thick and rounded at the base, tapering towards the top; they bear four or five lance-shaped, plaited leaves, 1ft. to 2ft. long, of glaucous-green colour. The racemes of fragrant flowers are produced from the current season's growth about July. Each flower is 3in. in diameter, with the fleshy sepals and petals lemon-coloured, and the lip yellow, with a streak of dark brown down the centre. The flowers are remarkably distorted, and show more plainly, perhaps, than those of any other species the peculiar character of the genus. The lip is twisted obliquely, and, being uppermost, projects above the column. Mexico, 1842. (B. R., 1843, t. 33.)



FIG. 106. MORMODES PARDINA (much reduced).

Var. *eburnea* is a much superior plant, with similarly-shaped flowers. These are 3in. to 4in. in diameter, very fragrant, and of a uniform creamy-white. Few Orchids are more effective than a well-flowered specimen of this variety.

Var. *punctata* has white flowers, the petals and sepals of which are profusely spotted with red on the inner side.

M. pardina (*Batem.*).—A curious and rare species, with stem-like pseudo-bulbs 4in. to 7in. in height, and dark green lanceolate, striated leaves. The scapes are over 1ft. long, with the numerous flowers crowded on the upper half. The sepals and petals are ovate and pointed, spreading at the base, but with the tips converging upwards. The lip is three-lobed, the

Mormodes.

side-lobes being smaller and reflexed; like the other parts of the flower, it is of a bright yellow, marked with brownish-crimson spots. It flowers during July and August. Mexico, 1837. (Fig. 106; B. M., t. 3900.)

Var. *unicolor* resembles the type in habit and form of flower, but the flowers are of a deep lemon-yellow and unspotted. (B. M., t. 3879.).

MYSTACIDIUM.

Lindley's name for a genus belonging to the tribe *Vandeæ*; it is derived from *mustax*, *mustakos*, a moustache, and *eidos*, resembling; in allusion to the pointed prolongation of the lip. Two or three species have been described, but it is very questionable if any are in cultivation outside botanic collections. They are natives of tropical and Southern Africa. Flowers usually small, racemose; sepals and petals nearly equal, free, spreading; lip affixed to the base of the column, produced in a long slender spur, the lateral lobes sometimes ovate, erect, sometimes nearly obsolete, the middle one erect or spreading, often ovate, undivided. Leaves distichous, usually few, coriaceous, spreading. Stems leafy, rigid. Allied to, and requiring the same cultural conditions as, *Angræcum*.

NANODES (*Lindl.*). The plants formerly found under this name are now removed to **Epidendrum.**

NEOBENTHAMIA.

Rolfe's name for a monotypic genus belonging to the tribe *Vandeæ*, and bestowed in honour of Mr. George Bentham, joint author with Sir Joseph Hooker of the "Genera Plantarum"; the prefix *neo* (new) is to distinguish it from the two previously founded, but abandoned, genera *Benthamia*. The species requires intermediate-house treatment, similar to that recommended for *Cymbidium*.

N. gracilis (*Rolfe*).—Flowers pure white, with two rows of reddish spots on the lip, nearly 1in. across; racemes short, erect, terminal, many-flowered. Leaves long-linear, acuminate, sheathing at the base, recurved. Stems long, thin, tufted, bamboo-like. Eastern Tropical Africa, 1884. It flowers in February. (B. M., t. 7221; G. C., 1891, x., p. 272, fig. 33.)

NEPHELAPHYLLUM.

For this genus of the tribe *Epidendreæ*, and of which but a few species have been described, Blume stands sponsor. The name is from *nephele*, a cloud, and *phyllon*, a leaf, and is in reference to the marks upon the leaves. The species are creeping, terrestrial Orchids, natives of Southern China, the East Indies, and the Malayan Archipelago. Flowers loose or densely racemose, on leafless scapes. Leaves stalked, ovate-lanceolate or cordate, usually purplish beneath, spotted or clouded above. They require the same cultural conditions as *Anœctochilus*.

NEUWIEDIA.

A commemorative name given by Blume for a genus consisting of about five species of warm intermediate-house terrestrial Orchids, belonging to the tribe *Apostasieæ*. Flowers small, nearly or quite sessile; sepals and petals equal, free, connivent, or at length spreading; lip subspathulate, otherwise similar to the petals; column short; spike or raceme terminal, dense, simple, often elongated; leaves long, contracted to the petioles. The species, which are natives of Malacca and the Malayan Archipelago, require similar cultural conditions to *Cypripedium*.

OBERONIA.

To this genus of the tribe *Epidendreæ* belong several species of stove or warm intermediate-house epiphytal Orchids, natives of tropical Asia, Australia, and the Mascarene and Pacific Islands. The name, given by Lindley, is after Oberon, the Fairy King, and is in allusion to the quaint and variable forms of the plant. Flowers small, in numerous dense, sub-cylindrical racemes or spikes, sessile, or short pedicellate; sepals free; subequal; petals narrower, or shorter, than the sepals; lip sessile, usually concave. Leaves distichous; sheath compressed, equitant.

The species are rarely met with outside botanic collections. They should be grown in shallow pans or baskets, suspended near the roof in a compost consisting of two parts sphagnum to one of fibrous peat. They

Oberonia.

require liberal moisture during the active season of growth, both at the roots and in the atmosphere, but only sufficient during the resting season to keep the plants in a plump condition.

OCTADESMIA.

Bentham's name for a genus of two or three species of intermediate-house epiphytal Orchids belonging to the tribe *Epidendreæ*. It is from *okto*, eight, and *desme*, a bundle, and is in reference to the eight pollen-masses. The species are natives of Jamaica and San Domingo. Flowers mediocre, shortly pedicellate; sepals of almost equal length, somewhat spreading; petals a little broader than the sepals; lip at base of the column nearly erect; peduncle terminal, simple or slightly branched. Leaves linear-lanceolate, distichous, somewhat rigid, not fleshy. The species are rarely met with in cultivation. They do best in shallow pans or small teak baskets in a compost of about equal portions of peat-fibre and sphagnum.

OCTOMERIA.

A genus of cool-house epiphytal Orchids, belonging to the tribe *Epidendreæ*, and closely allied to *Pleurothallis*. The name given by Robt. Brown is from *okto*, eight, and *meris*, a part; in allusion to the pollen-masses. Flowers whitish or yellowish, inconspicuous, in dense, sessile clusters; anther-bed rotundate; rostellum short; pollinia eight. Leaves oblong, linear, or sub-terete. Stems developed. The plants, which are of botanic interest only, require the same cultural conditions as *Pleurothallis*.

ODONTOGLOSSUM.

Rapid strides have been made during recent years in the cultivation and knowledge of this family, one of the most beautiful of the *Orchideæ*. *Odontoglossum* was founded by Humboldt in 1815, and up to 1833 there were only five species known; whereas at the present time the number described is considerably beyond a hundred. It is distinguished botanically from *Oncidium*, to which it is

Odontoglossum.

closely allied, by the column being long and club-shaped —or, at any rate, usually narrowed at the base—and by the base of the lip being always parallel with the face of the column, and sometimes joined to it. Lindley adds that the lateral sepals are very rarely united. Odontoglossums are either epiphytal or terrestrial, with pseudobulbs springing from a stout, creeping rhizome; the leaves are leathery or thin; the flowers are in few- or many-flowered racemes or panicles, proceeding from the rhizome, and are often very handsome. The species are natives of Mexico, Central America, Peru, and Colombia. The name is derived from *odons*, *odontos*, and *glossa*, and signifies tooth-tongued—in allusion to the form of the labellum, and to its bearing tooth-like projections, called "calli," at the base.

Odontoglossums being in many respects among the most desirable of Orchids, we have included here the majority of the kinds known. Many of the species—such, for instance, as *O. crispum*—are exceedingly varied in floral characters, and whilst some of the best-marked forms (Fig. 107) are considered by certain authors to be distinct enough to rank as species, others class them as varieties only. A better knowledge of the species in their native habitats has demonstrated the fact that certain of them are now found growing together in some localities that were at one time supposed to grow hundreds of miles apart. The fact of two or more species being found growing together, and plants having flowered among importations of these, bearing the exact intermediate characteristics of the species known to grow in the same locality, leaves no doubt as to their being of hybrid origin. Although some of these have been described as species they will be found in this work in the list of Natural Hybrids.

Culture.—As in the early days of Orchid-culture in this country it was considered necessary to treat all exotic Orchids as stove plants, it is not surprising that Odontoglossums failed for some time to become established in our collections. This, however, has been long since changed, and now all, or very nearly all, known Odontoglossums are placed along with "cool Orchids." Some of our leading growers have put many of the species to the

Odontoglossum.

test of open-air culture. Although it is not intended to advocate the open-air culture of exotic Orchids, it should be distinctly understood that the genus *Odontoglossum* is purely alpine, no single species having hitherto been found low down the mountains, or in hot regions. The plants will not exist long in a healthy condition if kept in hot, close houses: this should be sufficient to recommend them to the notice of amateurs. They enjoy a cool, moist atmosphere all the year round, and, unlike the majority of Orchids, do not, except in a few isolated instances, require a dry season; indeed, many of them grow freely during the winter months, and these must never be allowed to get dry. For their cultivation, we prefer a house with a northern aspect or one running from north to south. In bright weather shading is essential, especially during the summer; but in winter, during very severe weather, no harm will be done to the plants if the thermometer falls as low as 45deg., whilst in hot summer weather the maximum temperature ought not to exceed 70deg. The normal temperature required under ordinary conditions is 50deg. in winter and 55deg. in summer. Above all things, a free current of air is indispensable to their well-being. Do not sprinkle them overhead much with the syringe, but preferably keep the air well charged with moisture by pouring water upon the stages and floors; and, as the temperature must be considerably lower at night than during the day, the condensation which this produces will be most beneficial to the plants.

Although Odontoglossums grow naturally upon the trunks of trees, or in the vegetable *debris* that is lodged at the base of the branches, we have never known them thrive for any length of time when grown upon blocks, probably because evaporation takes place too rapidly, and the roots get withered up. Some of the species send their roots through and about the various mosses that clothe the forest-trees in the humid mountain regions where they most abound, adhering so slightly to the branches that a well-known collector once said that he found he could bring immense quantities of *O. crispum* down to the ground by merely throwing his lasso into the branches upon which the plants grew, and then pulling it towards him.

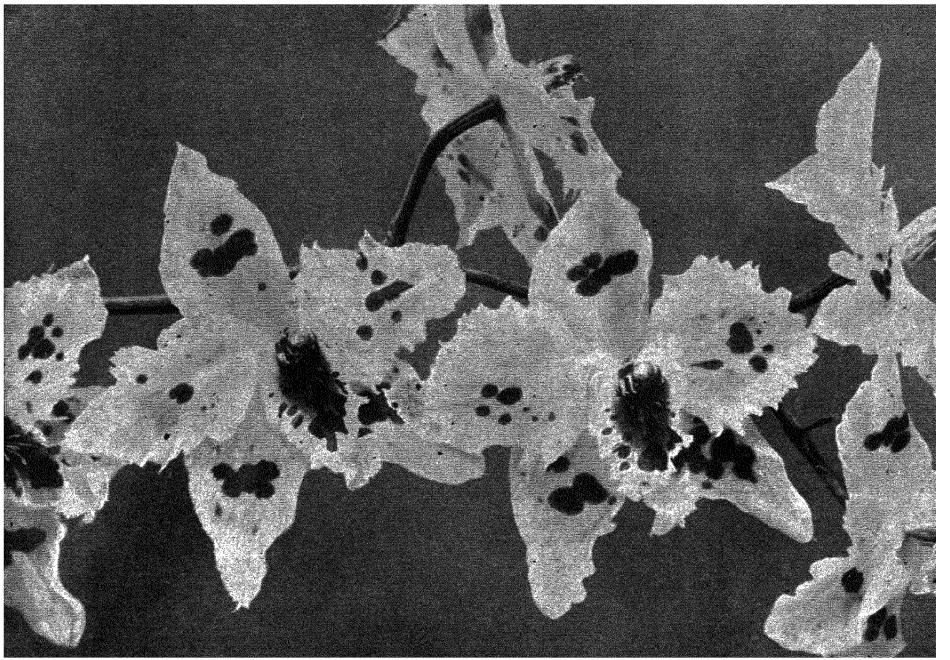


FIG. 107. FLOWER-SPIKE OF A FINELY-SPOTTED VARIETY OF ODONTOGLOSSUM CRISPUM (nat. size).

Odontoglossum.

Culture.—*O. crispum*, which is the species most sought after at the present time, is annually imported in large quantities and offered for sale at the weekly auctions in London, and by importers in the Orchid trade. It is not by any means the easiest subject to import, and plants are seldom met with in a robust condition when thus obtained. It is, therefore, remarkable to find how quickly the pseudo-bulbs plump and present signs of renewed vitality after they reach our greenhouses. It is not advisable to pot-up imported *O. crispum* immediately they are received. By far the better plan is to lay the plants out on the stage, the latter being covered with a bed of ashes, sphagnum, or other moisture-retaining material. If kept shaded, and the atmosphere of the house be fairly humid, they quickly regain their normal proportions, and commence to emit roots and make new growth. When this occurs, plants may be potted up, and they soon become established in their new surroundings. The pots used should be just sufficiently large to contain the plants comfortably. The pot should be filled to two thirds its depth with chopped Bracken Fern rhizome, such as is discarded when picking the peat for Orchids. After the plant has been placed in position in the centre of the pot, the remaining space should be filled in with a compost consisting of equal portions peat and living sphagnum pressed moderately firm. The plants should be watered as soon as potting is complete, wetting the compost through. Careful watering will afterwards be necessary, as the above compost does not dry nearly so quickly as when the broken potsherds are used for drainage.

In dealing with the re-potting of established plants, no hard-and-fast lines can be laid down. Where the conditions suitable to the plants' requirements are afforded, the season of the year is not of much importance, so long as the plant is commencing to emit new roots from the base of the newly-made or developing pseudo-bulbs. As, however, the bulk of the plants complete their growth, or commence to emit their new roots about the end of August and through September, it is advisable to get all potting done at such a season. March and April are preferred by some, and it is also a very good season to undertake re-potting. The re-potting of cool Orchids of

any description, at the season of the year when they are likely to become distressed after the operation, is not advocated. It is difficult always to avoid summer potting when *O. crispum* flowers are required at all seasons of the year. Consequently, in some instances, summer potting has to be resorted to, especially where the compost has become sour and decomposed.

Leaf-mould, especially that known as Belgian leaf-soil, has of late been advocated by many prominent Odontoglossum growers as a substitute for the compost recommended above. There can be no doubt that, with careful treatment in respect of watering, highly satisfactory results may be achieved from its use. Where leaf-soil is used, a liberal sprinkling of rough sand must be added to maintain it as porous as possible. The best leaves for the purpose are oak and beech, partly decayed; these should be mixed, dried, and rubbed through a sieve, using a still finer one to separate the moderately coarse from the very fine. It is the former that should be used for potting purposes. The leaf-soil must be pressed moderately firm, or it will be found difficult to induce the sphagnum to grow on its surface. The leaf-soil absorbs a quantity of moisture from the atmosphere, and therefore watering must be done with great discrimination, spraying only on the top of the moss being all that is necessary.

O. Alexandræ (*Batem.*).—A form of *O. crispum.*

O. apterum (*Llav.* and *Lex.*).—A free-growing species bearing its beautiful flowers in May and June. Pseudo-bulbs large, two-leaved. Leaves 9in. long by 1in. broad. Flower-scape stout, as long as the leaves, and producing from three to seven flowers, which are each 3in. across and snowy-white, except at the base of the sepals and petals, where they are prettily spotted with cinnamon-brown. A native of Mexico, where it grows at a height of 10,000ft., in exposed situations. It should be grown in a cool house, and be kept moist at the root all the year round. Syn. *O. Nebulosum.* (Batem. Monog., t. 1.)

O. bictoniense (*Lindl.*).—This was the first Odontoglot to reach England in a living state; but since the introduction of so many finer kinds it has gone somewhat out of favour, although it is remarkably free. The pseudo-bulbs are ovoid. The leaves are 1ft. long, bright green, distinctly nerved. The scape is erect, and frequently attains a height of 2ft. or even more;

Odontoglossum.

the flowers are 1½in. across, and vary much in colour; they are yellowish, blotched with brownish-purple; the lip is lilac, heart-shaped, with a wavy margin. It usually blossoms in autumn, and lasts a long time in perfection, provided the flowers are not allowed to get wet. Guatemala, 1835. (B. M., t. 3812 —where it is erroneously stated to be African—as *Zygopetalum africanum*.)

O. blandum (*Rchb. f.*).—An exceedingly pretty but rare species. Pseudo-bulbs as large as a walnut, compressed, two-leaved. Leaves narrow, about 9in. long. Spike a little longer than the leaves, bearing six to twelve flowers; sepals and petals equal in size, tapering to a point, white, copiously spotted with red-purple; lip 1in. long and about half as broad, wavy, the edges notched and toothed, and the apex pointed; colour the same as the petals; crest yellow, with two erect narrow teeth. The flowers are produced at various times in the year; naturally, it is said to flower all the year round. It requires a moist atmosphere, plenty of water, and a temperature a few degrees warmer than the cool-house. It first flowered in England at Chiswick in 1871. The rarity of this species (which is a native of Colombia) in collections is due to the great difficulty experienced in importing it alive. (Batem. Monog., t. 28.)

O. Bluntii (*Rchb. f.*).—A synonym of *O. crispum*.

O. brevifolium (*Lindl.*). — A synonym of *O. coronarium miniatum*.

O. cariniferum (*Rchb. f.*).—Large, well-marked flowers, which are developed in profusion annually, characterise this handsome species. Pseudo-bulbs oblong, compressed, 3in. to 4in. long, two-leaved. Leaves leathery, about 1ft. long. Flower-spikes stout, branched, the branches zigzag; flowers 2in. across; sepals and petals acute, with a distinct keel at the back, olive-brown, tipped and edged with yellow; lip narrow at the base, suddenly expanding into a kidney-shaped blade, white, becoming brown with age, the crest mauve-red, and the column white, with purple stains. This should be grown along with *O. grande*; it flowers in October and November. Central America, 1848. (B. M., t. 4919.)

O. Cervantesii (*Llav.* and *Lex.*).—A dwarf-growing lovely species that grows and flowers freely under cool-house treatment. It should be planted in shallow pans, and suspended near the glass. The pseudo-bulbs are 1½in. long, compressed, with acute edges; each bears only one leaf, which is oblong, and

Odontoglossum.

4in. to 6in. in length. The flowers are 2in. in diameter, and are large for the size of the plant; they are produced during the winter months, lasting several weeks in full beauty, and are very fragrant. The sepals and petals are white, transversely streaked at the base with fine lines of reddish-brown ; the lip is marked in a similar manner, and is deeply three-lobed, the lower lobe being broad and heart-shaped. Mexico, 1847. (Fig. 108; B. M., t. 4923.)



FIG. 108. ODONTOGLOSSUM CERVANTESII, SHOWING HABIT AND DETACHED FLOWER

(Habit, much reduced; Flower, ⅔ nat. size).

Var. *decorum.*—Flowers larger; segments broader, streaks broader and shorter, and coloured purple instead of red. (W. O. A., vi., t. 251.)

Var. *punctatissimum.*—Flowers spotted all over with rose.

O. cirrhosum (*Lindl.*) (or *cirrosum*). — A graceful and pretty species, with elongated, compressed pseudobulbs, 2in. to 3in. in length, bearing two leaves about 1ft. long. Flowers 4in. across, produced in profusion on a long, arching, branched spike; sepals narrow, with long, flexuous, tail-like ends; petals a little broader at the base; lip three-lobed, the side lobes toothed, the middle one narrow, recurved, and tail-like; colour of all the parts milk-white, with spots of maroon scattered over them; crest yellow, with radiating red lines. The flowers appear in April and May. Ecuador, 1875. (B. M., t. 6317.)

O. citrosmum (*Lindl.*).—One of the most attractive of cool Orchids, and easily kept in health if grown at the warmer end of the cool-house, or along with the Cattleyas. It requires

little shading even in summer, and after its new pseudo-bulbs have ripened it should be kept quite dry till the fresh flower-scapes are visible in the apex of the new growth. The pseudo-bulbs are smooth, and shining light green. The leaves are thick, and darker in colour. The flowers, which are about 3in. across, and full in outline, are sometimes pure white, and sometimes (as in var. *roseum*) beautifully suffused with rose; they are borne on pendulous racemes, appearing about the months of May and June, and remaining in full beauty for three or four weeks. From fifteen to thirty flowers, which are delicately lemon-scented, are produced in each raceme. The lip has a long claw, and is suddenly expanded into a broad, kidney-shaped blade. Unlike all other species, this pushes its flower-spike along with the new growth, the former usually appearing when the latter is about 2in. long. It is also exceptional in having pendulous racemes. Introduced from Mexico in 1840. (Batem. Monog., t. 6.)

Var. *album* has flowers wholly white, except the yellow crest on the base of the lip.

Var. *punctatum* has rosy flowers, dotted with purple.

Var. *roseum* has a deep rose-coloured blade to the lip.

O. constrictum (*Lindl.*).—A pretty, free-flowering species. Pseudo-bulbs ovoid, compressed, dark green. Sepals and petals bright yellow, with orange-brown blotches and bars; lip fiddle-formed, white, tipped with yellow, and bearing two conspicuous rose-coloured spots near the centre; panicles large, branched, many-flowered. Leaves elongate, linear-lanceolate. Venezuela, 1843. (B. M., t. 5736.)

O. cordatum (*Lindl.*).—Pseudo-bulbs ovoid, compressed, shining green, each bearing a leaf 6in. to 8in. long. Scape erect, simple or branched, bearing few or many handsome flowers. Sepals and petals yellow, blotched and barred with deep rich chocolate-brown; they are very much elongated and curiously wavy, and the sepals are keeled behind. The lip is large and heart-shaped (whence the specific name), with a long, pointed apex; its ground-colour is white, blotched with lilac and purplish-red, or sometimes with pale yellow and crimson. This species blooms during late spring and early summer. Guatemala and Mexico, 1837. (B. M., t. 4847, as *O. maculatum*; the true *maculatum* is a different plant.)

Var. *sulphureum*.—Sepals and petals sulphur-yellow; lip white, with sulphur tips and blotches.

O. coronarium (*Lindl.*).—One of the most attractive species when in bloom, but unfortunately rather difficult to manage successfully. It has a long, creeping rhizome, bearing ovoid,

Odontoglossum.

one-leaved pseudo-bulbs, about 2in. apart. The leaves are 6in. to 10in. long, by about 2in. broad, and leathery in texture. Flower-spikes 1ft. long, bearing many flowers, each 2in. across, full; sepals and petals rounded at the apex, crisp-edged, and coloured coppery-brown, margined with yellow, and with a varnished appearance; lip broadening towards the apex, bright yellow, with a white crest and column. Colombia, 1847. (Batem. Monog., t. 27.)

O. coronarium and its varieties require an abundance of strong light to induce them to flower in a satisfactory manner. They should be grown in baskets and suspended near the roof-glass.

Var. *chiriquense*.—Flowers larger and paler; sepals chestnut-brown.

Var. *miniatum*.—Pseudo-bulbs more crowded on the rhizome. Flowers smaller and more numerous on the spike. Syn. *O. brevifolium*.

O. crispum (*Lindl.*).—This plant, better known under the names of *O. Alexandræ* and *O. Bluntii*, is, perhaps, the queen of the whole of the Orchid family. By a little management its charming flowers may be had all the year round. It is a plant that varies very considerably, no two of the many thousands imported being exactly alike, and very marked differences in size, colouring, and form of the flowers are constantly presenting themselves. The pseudo-bulbs are about 3in. long, compressed, ovoid, and each one bears a pair of strap-shaped leaves 1ft. long. The flower-scape is arched, sometimes branched. Strong plants produce many flowers on a scape. Each pseudo-bulb bears only one scape. Each flower is from 2in to 3in. across. In good typical forms the sepals and petals are white, ovate, or ovate-lanceolate, the petals being much undulated, and often fringed or toothed; the lip is oblong-acuminate, yellow, and crested towards the base, beautifully crisped at the margin, and more or less spotted towards the front with blotches of reddish-brown. This plant has been very largely imported from Colombia, and in some of its forms is flushed with a lovely tint of rose. Few flowers are more deservedly admired, and the variety that is so characteristic of the species tends to enhance its charms, as all its forms are beautiful. It is a matter for regret that this cannot retain the name of *O. Alexandræ*, which proves to be but one of the many forms of the previously-known *O. crispum*, the latter name, therefore, takes precedence. As many as 120 blossoms, in four racemes, have been produced by a single specimen. The original *O. crispum* is a plant of much earlier introduction. Karl

Odontoglossum.

Hartweg, who was sent to collect plants in Colombia for the Horticultural Society of London, found it in Bogota in 1841, with a spike 2½ft. in length, bearing from twenty to twenty-seven large flowers, the sepals of which were pinkish externally.

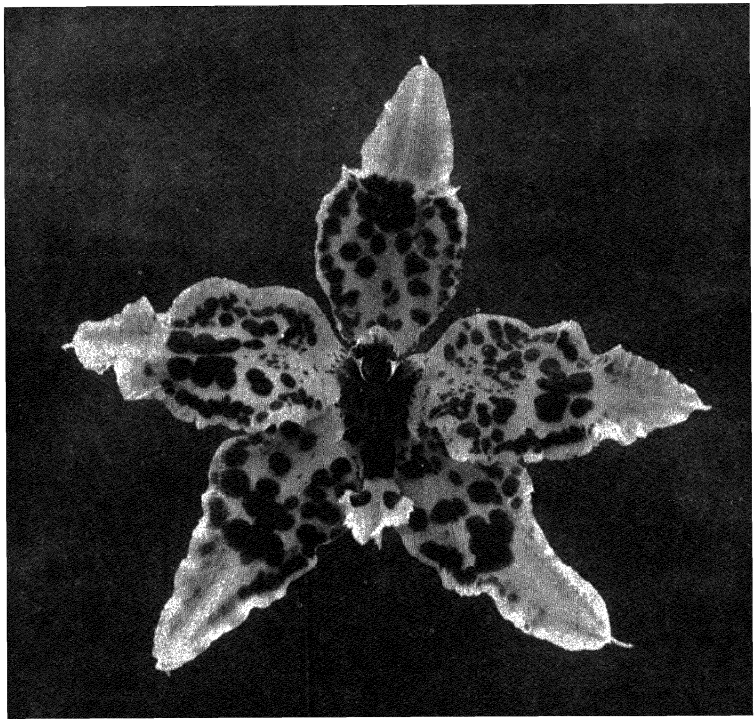


FIG. 109. FLOWER OF ODONTOGLOSSUM CRISPUM CONFETTI (nat. size).

There are some scores of named varieties of *Odontoglossum crispum* in cultivation at the present time. It is impossible, therefore, to give detailed particulars of all of these. We have selected about a score of the most prominent amongst them.

Var. *apiatum*.—This is considered one of the finest Odontoglossums in cultivation. Flowers very large, with broad, heavily

crested or toothed segments, pure white, marked with bold, rich chocolate-brown blotches.

Var. *Ashworthianum.*—Flowers of good shape and substance; sepals and petals are almost wholly of a bright rose-purple, clearing to a lighter shade, and finally becoming silver-white as it approaches the margins, where they are beautifully toothed and crisped; there are indications of white marks amongst the rose-purple, and a white area at the base; lip white, yellow on the crest, in front of which are some reddish-purple blotches. One of the most distinct and beautiful varieties.

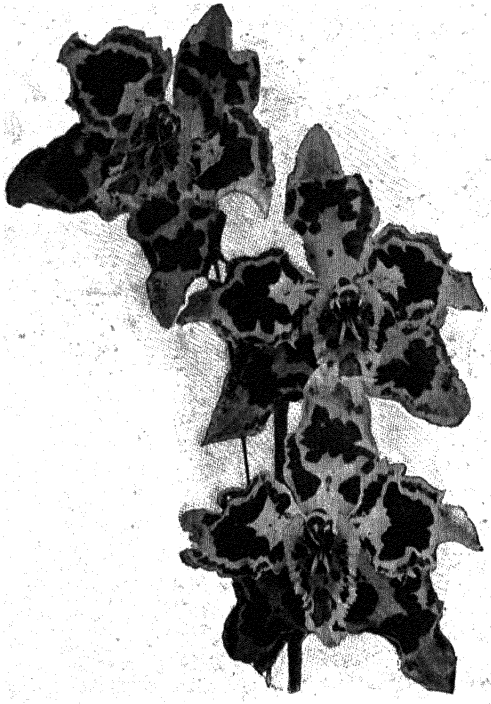


FIG. 110. FLOWERS OF ODONTOGLOSSUM CRISPUM FRANZ MAZREEL (much reduced).

Var. *aureum.*—A distinct variety in which the flowers are wholly flushed with lemon-yellow.

Var. *Baroness Schrœder.*—One of the rarest and most beautiful Odontoglossums. The flowers are of fine shape; sepals and petals covered with rich claret-purple, except for a few paler markings, and an area of white at the base and margin of the segments; lip white on the outer margins, the central area covered with reddish-brown blotchings, yellow on the disk.

Var. *Confetti.* — One of the most distinctly marked varieties. Sepals and petals white, flushed rose from colouring on exterior, the segments being thickly covered with miniature brownish-purple spottings; lip white, yellow on the crest, spotted with brown in the central area. (Fig. 109.)

Var. *Cooksonianum.*—A grand variety, with pure white segments; sepals and petals heavily blotched and spotted with

Odontoglossum.

a distinct shade of brownish-crimson; lip white, with one large blotch in the central area, and smaller spottings around the prominent yellow crest.

Var. *Franz Mazreel.*—One of the most handsome as well as one of the most distinct Odontoglossums. Sepals white,

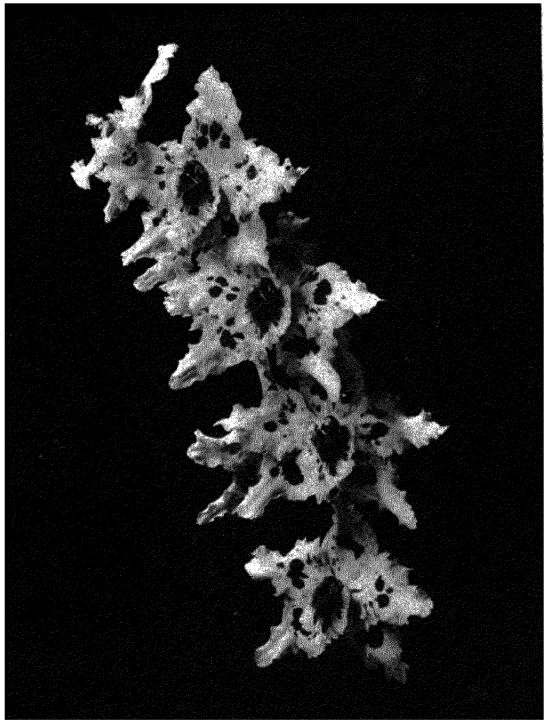


FIG. 111. FLOWERS OF ODONTOGLOSSUM CRISPUM KING EDWARD VII. (much reduced).

suffused with rose from the colour reflected from the exterior; there is a large blotch of rich purple in the centre, and there are some smaller blotches towards the base of each petal, as seen in the illustration, have almost the whole of the central area covered with a large blotch of the same rich purple as the sepals and some smaller markings on the outer edges; lip

Odontoglossum.

white, brown spotted in the centre, yellow on the crest. The wonderful symmetrical markings on the segments make this one of the most attractive and beautiful Orchids in cultivation. (Fig. 110.)

Var. *heliotropeum.*—A beautifully formed flower in which the segments are tinted with a distinct shade of heliotrope, and covered with numerous miniature brown spots.

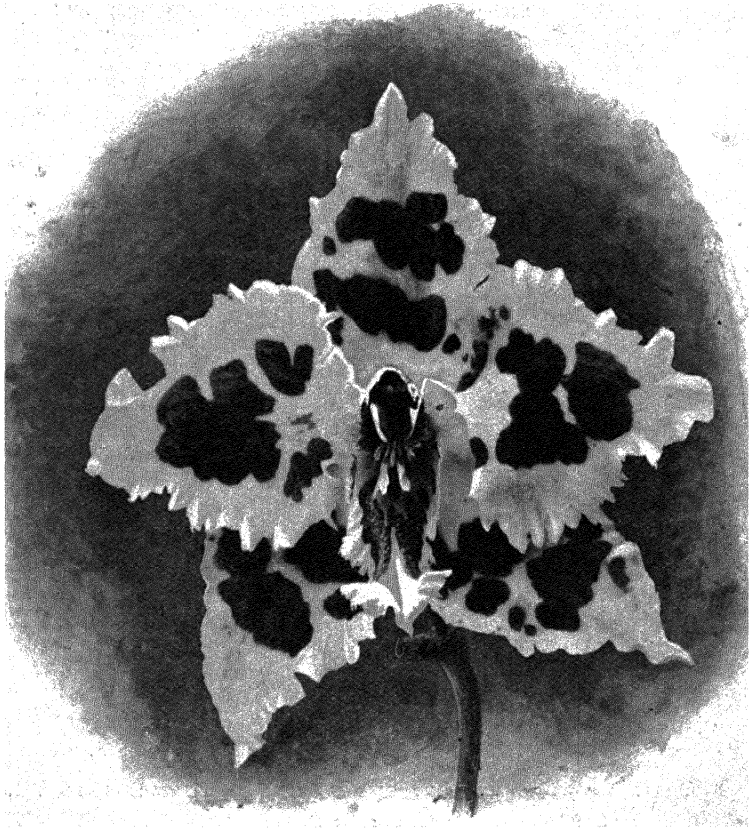


FIG. 112. ODONTOGLOSSUM CRISPUM LUCIANI
(nat. size).

Var. *King Edward VII.*—A lovely variety with white ground, faintly suffused with white rose on the sepals and petals, the spottings being of bright brown. The lip is white, spotted with brown in the centre, with the usual yellow disk. (Fig. 111.)

Odontoglossum.

Var. *Luciani.*—A grandly shaped flower; white, tinted with rose, each segment carrying large brown-purple blotches; lip with the usual yellow crest. This is undoubtedly one of the

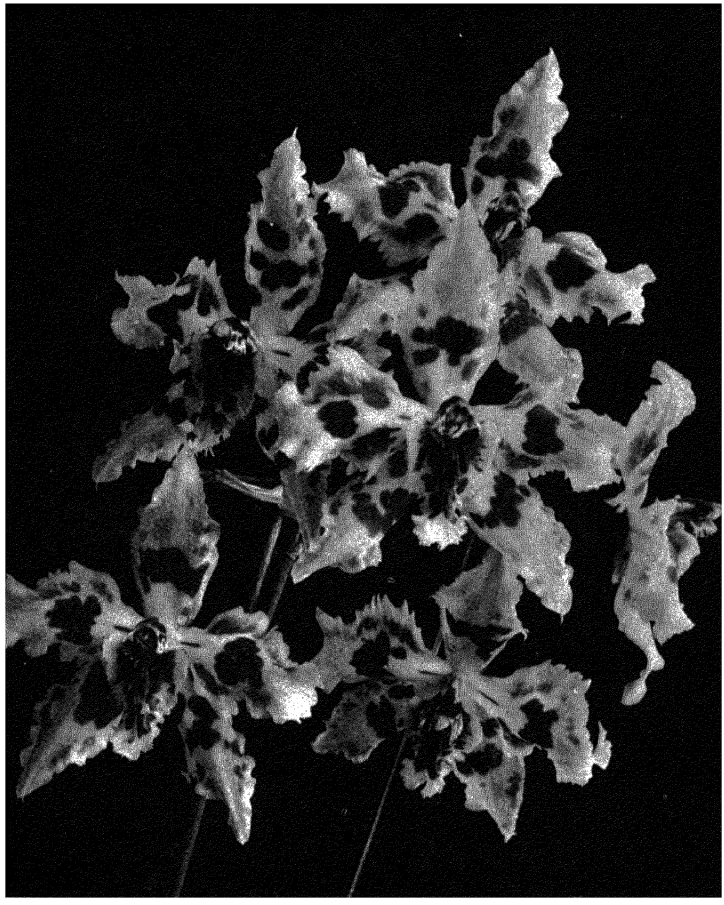


FIG. 113. FLOWERS OF ODONTOGLOSSUM CRISPUM PHŒBE (much reduced).

finest varieties of *O. crispum.* A small plant recently passed into the collection of a prominent North of England gentleman for the largest sum ever paid for an Orchid. (Fig. 112.)

Odontoglossum.

Var. *Mundayanum.*—One of the rarest varieties. The flowers are fine in shape and substance ; sepals and petals white, heavily and evenly blotched with large purple-brown markings ; lip white, spotted with reddish-brown in front of the yellow crest.

Var. *Phœbe.*—A most lovely variety that flowered in May, 1902, in Mr. Norman Cookson's collection, at Oakwood. The shape and markings resemble those of *O. c. Franz Mazreel*, but the

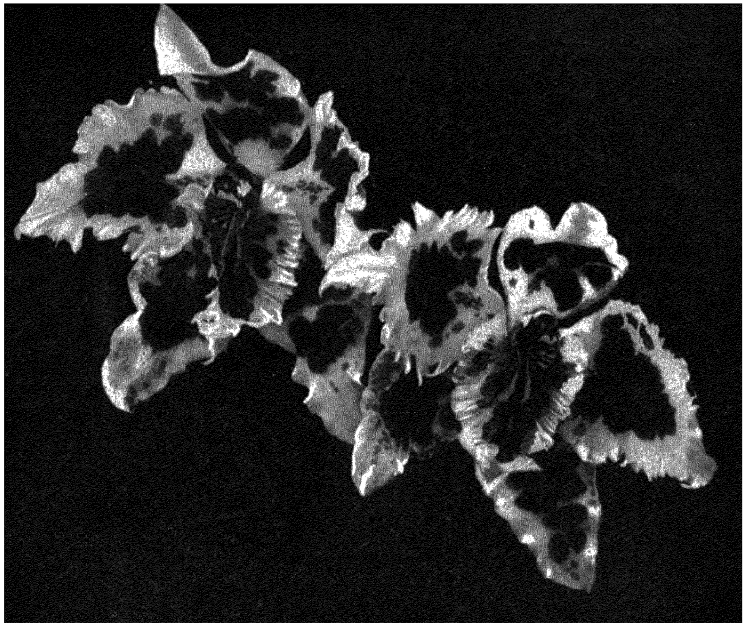


FIG. 114. FLOWERS OF ODONTOGLOSSUM CRISPUM PITTIANUM (much reduced).

colour is white, suffused with rose, the spottings being of rosy-purple. (Fig. 113.)

Var. *Pittianum.*—Of comparatively recent introduction, this plant first flowered in Mr. T. Rochford's nurseries from an importation collected by Mr. J. Carder. It received a First-class Certificate from the Royal Horticultural Society when exhibited on May 8th, 1900, by Mr. H. T. Pitt (Rosslyn, Stamford Hill). It is one of the finest varieties of *Odontoglossum crispum* in cultivation.

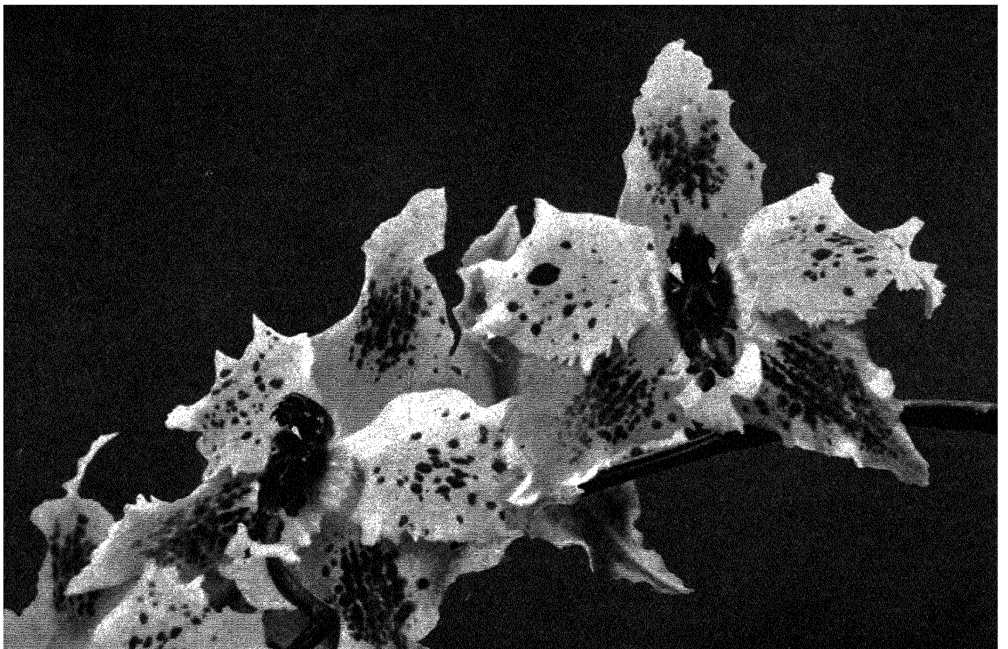


FIG. 115. PORTION OF FLOWER-SPIKE OF ODONTOGLOSSUM CRISPUM PURPURASCENS (nat. size).

Odontoglossum.

We are in a position to state that a thousand guineas have been offered, and refused, for Mr. Pitt's plant. (Fig. 114.)

Var. *purpurascens.*—One of the most distinct and choicest varieties. Flowers white, suffused with a delicate tint of rose; spottings bright brownish-purple. It was exhibited at the Royal Horticultural Society's meeting by the President of the Society, Sir Trevor Lawrence, Bart., on March 26th, 1901. (Fig. 115.)

Var. *Raymond Crawshay* is beautiful as to form. Sepals and petals white, evenly and beautifully spotted with brown, the markings on the sepals having a distinct shade of yellow surrounding the lower ones; lip broad, white, yellow on the crest, in front of which are some brown spottings. It obtained a First Class Certificate from the Royal Horticultural Society on Nov. 12th, 1901, when exhibited by Mr. D. B. Crawshay (Rosefield, Sevenoaks, Kent).



FIG. 116. FLOWER OF ODONTOGLOSSUM CRISPUM VEITCHIANUM

(⅔ nat. size).

Var. *Rex.*—Sepals and petals white, suffused with rose, each of the segments having one large, irregular, red-purple blotch and a few smaller ones at the sides. The lip is white, with a brown blotch in centre. A superb form.

Var. *Sanderæ.*—This is a rare and a marvellously coloured variety. Flowers round and compact; almost the whole surface is covered with large blotches of rich crimson-chocolate, the remaining portion being rosy-white; crest of the lip deep yellow.

Var. *Starlight.*—Sepals and petals white, tinted rose, the whole surface of each segment being densely covered with miniature red-brown spottings. One of the most charming and distinct varieties.

Var. *Sultan.*—Another distinct variety. The colour, as in the variety *Sanderæ*, covers practically the whole of the surface of

the sepals and petals, which are reddish-chocolate, the remaining portions being white, save for the yellow crest on the lip.

Var. *The Earl.*—One of the largest varieties. Sepals white, spotted with large, nearly confluent, reddish-brown blotches; petals white, with one large and some smaller spots in the central area, of the same colour as the sepals; lip white, with a large brown blotch in front of the yellow crest.

Var. *Veitchianum.*—In this most rare and beautiful form the ground-colour is white, the markings being brownish-crimson. The disk of the lip is yellow, with brown spottings in front. (Fig. 116.)

Var. *Victoria Regina.*—One of the most beautiful of the new introductions. It first flowered in the collection of Mr. W. Thompson (Stone, Staffordshire) and received a First Class Certificate from the Royal Horticultural Society on April 24th, 1900. Flowers of good shape and substance. Sepals and petals covered on the exterior with rosy-purple, which colour is reflected through the white interior, sparingly spotted with reddish-brown; lip white, with a few reddish-brown spots in the centre.

Var. *xanthotes.*—Flowers pure white, save for three yellow spots on the lip.

O. cristatum (*Lindl.*).—In this little species the pseudo-bulbs are somewhat oval, of a light shining green, bearing very narrow leaves of the same hue. The flowers are creamy-yellow, varying in shade in the different forms, and banded or spotted with very dark brown or purple. The great prominence of the processes upon the lip, which is yellow or white, with a few brown spots, has given rise to the specific name. The flowers have in the evening a faint odour of Meadowsweet. A native of Ecuador. (Ill. Hort., 1870, t. 21.)

O. Edwardii (*Rchb. f.*).—In the colour of the flowers this species is exceptional, no other Odontoglossum being at all like it. Being easily cultivated, and a free plant to bloom, it has become a very popular Orchid, although its flowers are rather small. The pseudo-bulbs are 4½in. long, ovoid, and two-leaved. The leaves are 1ft. or more long. Flower-spike almost erect, very stout, branched, and crowded with flowers, each 1in. across. All the segments are about equal in size and form; they are oblong, wavy, and coloured violet-purple or puce, except the crest, which is yellow. Introduced from Ecuador, and flowered for the first time in England in 1880. It requires cool treatment, and plenty of water when growing. It usually flowers in early spring. (B. M., t. 6771.)

Odontoglossum.

O. gloriosum (*Lind.* and *Rchb. f.*).—Somewhat resembling *O. crispum.* Scape 1ft. to 2ft. high, often branched; flowers variable, hawthorn scented; segments rather narrow; sepals and petals yellow, spotted with chestnut-brown; lip large, yellow, with a large blotch of brown in front of the toothed crest. Colombia. (Batem. Monog., t. 12.)

O. grande (*Lindl.*).—One of the best-known species in cultivation. Pseudo-bulbs 2in. to 4in. high. Leaves 8in. to 10in. long, dull green, and of thick texture. Scapes about 12in. high, four to seven-flowered, produced when the pseudo-bulb is partly formed; flowers large, 5in. to 7in. across, showy; sepals bright yellow, barred with deep brown; petals, the basal halves often entirely deep brown, the apical portions bright yellow; lip short, white or creamy-yellow, spotted with brown, most prominently near the base. Autumn. Guatemala, 1839. This species, together with *O. Insleayi*, *O. Schlieperianum* and *O. g. Williamsianum*, require slightly warmer conditions than the other members of the genus; they should also be kept drier after growth is complete. (B. M., t. 3955.)

Var. *Williamsianum* (*Rchb. f.*) has shorter, broader, and more obtuse petals; column with uncinate wings.

O. Hallii (*Lindl.*).—Pseudo-bulbs long, thin, narrow, with acute edges, and furrowed. Each pseudo-bulb produces two leaves, which are about 1ft. long. Scape is from 3ft. to 5ft. long, arching, branched, and many-flowered. The flowers are 3in. to 4in. across; the sepals and petals are pale yellow, with large chocolate-brown patches and spots, and are remarkable for their long points; the lip is pure white, with a beautifully-fringed margin, and is spotted and blotched with red, and stained towards the base with deep yellow. This species requires cool treatment, flowering in March and April. There is considerable variation in the depth of colour and spotting of the flowers, but there is not one variety that may not be ranked with first-rate Orchids. Peru and Ecuador, 1864. (B. M., t. 6237.)

O. Harryanum (*Rchb. f.*).—A very handsome and most distinct Odontoglossum. Its pseudo-bulbs are oval-oblong, compressed, furrowed when mature, 3in. long, two-leaved. The leaves are leathery, and a little less than 1ft. in length. Flower-spikes erect, longer than the leaves, few-flowered; flowers very variable in size, structure, and colour; sepals oblong, with short, pointed tips, wavy, chocolate-brown, with broad, vein-like streaks of yellow; petals white at the base, with broad, irregular lines of purple; lip large, roughly triangular, white, with numerous streaks of purple, the apical portion being wholly white; crest yellow.

Odontoglossum.

Colombia, 1886. This has proved the most useful Odontoglossum for hybridisation purposes, several most desirable additions having been obtained from its use as a parent. (Fig. 117, for which we are indebted to the Editor of the "Gardeners' Chronicle.")

O. hastilabium (*Lindl.*).—This is a spring-flowering plant, lasting in blossom about two months. It has large, pale, shining green pseudo-bulbs, and broad leaves 1ft. long. The spike is 2ft. to 3ft., or sometimes even as much as 6ft. in height, and much-branched, with numerous very fragrant blossoms, which are about 3in. across; the sepals and petals are of a soft creamy-white, beautifully streaked with transverse lines of purplish-brown; whilst the somewhat halbert-shaped lip is white, with a dark rose base. A native of Colombia, where it was discovered in 1843, at the comparatively low elevation of 2500ft.; it extends upwards, however, to between 4000ft. and 5000ft., "forming large masses on the surface of the ground, its roots extending to a considerable distance among the decaying vegetation. It is also found attached to the stems of enormous lianas, overhanging the mountain streams. Under these conditions it forms large pseudo-bulbs, and produces panicles of flowers 4ft. to 6ft. long" (Veitch). This stately species should be grown in the Cattleya-house, or, at any rate, in a house about 7deg. warmer than the cool species require. (B. M., t. 4272.)



FIG. 117. FLOWERS AND PORTION OF LEAF OF ODONTOGLOSSUM HARRYANUM

(½ nat. size).

O. Hunnewellianum (*Rolfe*).—Pseudo-bulbs about 2in. high. Leaves 6in. to 9in. long. Scape 15in. to 18in.; flowers round; sepals and petals yellow, varying in shade, spotted with dark brown; petals paler at base; lip creamy-white, spotted with light

cinnamon, crenulate at the margins; crest toothed. A most distinct and desirable species, allied to *O. Schillerianum*, and supposed to be one of the parents of the variable natural hybrid *O. Adrianæ*. Colombia, 1889.

O. Insleayi (*Barker*).—The pseudo-bulbs, leaves, and flower-spike of this are similar to those of *O. grande*. The flowers are from 2in. to 4in. across; the sepals and petals are oblong, wavy, yellow, transversely banded with dull reddish-brown; the lip is spoon-shaped, bright yellow, dotted near the margin with cinnamon. This species is a native of Mexico, whence it was introduced about 1840. It was then lost to collections for about twenty years, and, as Mr. Bateman observes, "its re-appearance is entirely due to the adoption of the rational system of cool treatment now prevailing, under which it may be cultivated with the greatest ease." We cannot agree with this statement, as we find that it does best under slightly warmer and drier conditions than those obtaining in the Odontoglossum-house. (See note in reference to culture under *O. grande*.) It blooms at various times of the year, but mostly in the autumn. (Batem. Monog., t. 4.)

Var. *leopardinum*.—Sepals and petals deep yellow, barred across with bands of reddish-crimson; lip rich yellow, beautifully bordered all round with spots and dots of the same dark colour.

Var. *splendens*.—Flowers very large, of a uniform ochre-yellow, except the lip, which is zoned with red blotches. (R., t. 7.)

O. I. macranthum (*Lindl.*).—A synonym of *O. Schlieperianum*.

O. Kegeljani (*E. Morr.*).—A robust and handsome kind, similar to *O. Hallii* in pseudo-bulbs and foliage. Flower-spikes 2ft. long, arching, and branched; flowers 3in. across; sepals and petals broad, acute at the points, lemon-yellow, with red-brown blotches; lip oblong, with a crisped edge, red-brown, bordered with yellow; column white, with brown blotches. It flowers in April and May, and requires cool, moist treatment all the year round. Syn. *O. polyxanthum* (*Rchb. f.*). (W. O. A., vi., t. 258.)

O. Krameri (*Rchb. f.*).—A small plant, with almost round, compressed pseudo-bulbs 1½in. in diameter, and bearing each only one leaf, which is about 8in. long. Flower-spike short, three- to five-flowered; flowers 1½in. across; sepals and petals similar, pale violet in the centre, shading off to white at the margin; lip with a two-lobed apex, purplish in colour, with

streaks of white and brown at the base; column white. A rare plant, although introduced in 1868 from Costa Rica. It should be grown in the warm house, suspended near the roof-glass; and it enjoys liberal supplies of water, except when at rest in winter. (Batem. Monog., t. 24.)

O. læve (*Lindl.*).—This is interesting chiefly on account of the fragrance of its flowers. It is a robust grower, producing stout scapes often 3ft. long. The flowers are 2½in. across, cinnamon-brown, barred with dull yellow; lip broad, with a tail-like tip, lilac and white or pale rose. It flowers in spring. Mexico, 1841. It thrives under the same treatment as *O. crispum*. (Batem. Monog., t. 15.)

O. Lindeni (*Lindl.*).—Flowers comparatively small, borne on scapes 2ft. or more long, branched; sepals and petals clear yellow, shaded with green at the base; lip clear yellow, with a prominent fleshy crest. Spring. Colombia, 1842-3. Syn. *O. platyodon.*

O. Lindleyanum (*Rchb. f.*).—A very variable species, undoubtedly one of the parents of some of the natural hybrids. The flowers, which are somewhat thin, are 2in. to 3in. across; the sepals and petals are yellow, with a few reddish blotches; the lip is three-lobed, the two lateral lobes being small, white, with purple spots, and the middle lobe red-brown, tipped with yellow. Colombia. It thrives if grown with, and treated the same as, *O. crispum*, flowering in spring. Syn. *O. mirandum.* (Batem. Monog., t. 11.)

O. Londesboroughianum (*Rchb. f.*).—A distinct plant, handsome when well grown, but, as a rule, unsatisfactory under cultivation. Its stout, creeping rhizome bears ovoid pseudo-bulbs 3in. apart, and two-leaved. The spike is 3ft. long, branching, and bears, in the autumn, numerous bright yellow flowers 1in. across, full, and sometimes marked with concentric lines at the base. Although introduced in 1876, and frequently since then, this plant has not been a success under cultivation, owing to its shy flowering characteristics. It requires strong light in summer, plenty of water whilst growing, and drought when at rest. (W. O. A., t. 82.)

O. luteo-purpureum (*Lindl.*).—In this species we have a plant of robust habit, and extremely variable both in size of flowers and in the intensity of their markings—so much so that hardly two specimens are alike. Its pseudo-bulbs, leaves, and habit, are as in *O. crispum*, but stronger. Flowers from 3in. to 4in. across; sepals and petals equal, rich brown or

purple, blotched and banded with white or light yellow, and having a golden-yellow border; lip white, with a brown base, minutely serrate or fringed. This species blooms during spring, and may be grown along with *O. crispum*. Colombia, at an elevation of 8oooft. or more. (Ill. Hort., 1871, t. 73.)

"As a species, *O. luteo-purpureum* is one of the most variable known, a circumstance to be partly accounted for by the large area over which it is spread, and by its intermixture with other species, which has resulted, not only in the production of natural hybrids, but also from them and their parents has sprung an exceedingly mixed progeny" (Veitch).

Var. *sceptrum*.—Flowers smaller than in the type, beautifully marked with deep brown on a golden ground; lip with a large horseshoe blotch in front, and heavily fringed on the outer margins.

Var. *Vuylstekeanum*.—Flowers smaller than in the type; colour a beautiful mixture of nankeen-yellow blotches on a sulphur-yellow ground.

O. maculatum (*Llav.* and *Lex.*).—Although surpassed in beauty by many newer kinds, this old garden plant is still worth cultivating. In pseudo-bulbs, leaves, and spike, it closely resembles *O. cordatum*; but it differs from that species in having shorter and broader sepals and petals, and a more rounded lip, which is yellow, spotted with brown. The flowers are usually developed in March and April, and they remain for a considerable time in full perfection. This species is common in many parts of Mexico, where it was one of the earliest kinds discovered; it was introduced in 1838. (Batem. Monog., t. 20.)

O. madrense (*Rchb. f.*).—A synonym of *O. maxillare*.

O. maxillare (*Lindl.*).—A rare and pretty species, with narrow, thin pseudo-bulbs, 4in. long, and two-leaved. The leaves and spike are about 10in. long, and the flowers are arranged in two series, usually about ten on a spike; they are fragrant, 2½in. across; the sepals and petals are lance-shaped, and keeled at the back, white, purplish at the base; the lip is shorter than the petals, with a narrow, yellow base, and a trowel-shaped, white blade. The flowers are similar to those of *O. Cervantesii*. Introduced in quantity from Mexico, 1872. It should be grown in a warm corner of the cool-house in summer, and wintered with the Cattleyas. Syn. *O. madrense*. (B. M., t. 6144.)

O. miniatum (*Hort.*).—A variety of *O. coronarium*.

O. mirandum (*Rchb. f.*).—A synonym of *O. Lindleyanum*.

Odontoglossum.

O. nævium (*Lindl.*).—Judging from the few examples hitherto imported, this beautiful species would seem to be rare in its native habitat. The pseudo-bulbs are oblong, flattened, and deep green. The leaves are oblong and narrow, and of the same colour. The scape is erect, bearing an arching panicle of numerous somewhat star-shaped flowers; the sepals and petals are about 2in. long, and beautifully crisped or waved, the ground-colour being white, profusely speckled and spotted with rosy-purple and crimson markings (whence the name *nævium*, or freckled). This species delights in a cool, moist atmosphere all the year round. It was discovered in Colombia in 1842, at an altitude of 8oooft. (W. S. O., t. 7.)

Var. *majus* is the best variety; it is larger, and more compact in habit, and is one of the rarest of the genus. (Batem. Monog., t. 9.)

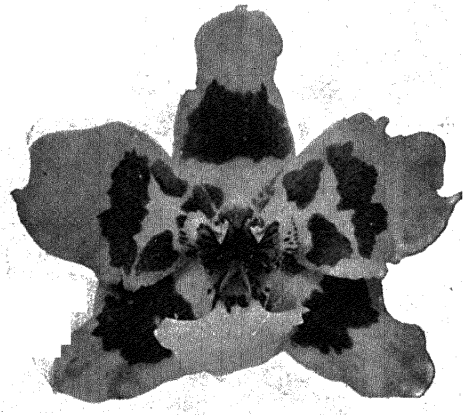


FIG. 118. FLOWER OF ODONTOGLOSSUM NOBILE VEITCHIANUM (nat. size).

O. nebulosum (*Lindl.*).—A synonym of *O. apterum.*

O. nobile (*Rchb. f.*).—This species is justly considered one of the loveliest of the whole genus. It has the habit of *O. crispum*, but the pseudo-bulbs are smaller. The flower-spikes are long and arching, usually branched, sometimes bearing upwards of fifty, or even a hundred, flowers; the sepals and petals are snow-white, although varieties sometimes occur in which a shade of rose is to be found; the lip is fiddle-shaped, white, blotched at the base with purplish-crimson and yellow. The flowers are so chastely beautiful that we would choose this amongst the first in forming a collection; they last a long time in perfection. The plant blooms at various times, but usually during April and May. The species was discovered in 1847, in the oak forests of Colombia, at an elevation of about 8oooft., whence it was introduced about 1851. Syn. *O. Pescatorei.*

Odontoglossum.

Var. *Lindenii.*—A beautifully shaped flower; the sepals, petals, and lip are blotched with rich claret-purple.

Var. *Schrœderianum* is similar to var. *Veitchianum.*

Var. *Veitchianum.*—Flowers larger than in the ordinary forms, very symmetrical, and irregularly blotched with rich magenta-purple. (Fig. 118).

Var. *Vervœtianum* is another richly-marked variety.

There is considerable variation in the markings of the flowers, some being tinged with rose or purple, others streaked, whilst in the number of spots the range is from a solitary one on the lip to numerous blotches all over the segments. All these should be cultivated in the same manner as *O. crispum.*

O. Noezlianum (*Lind.*).—A synonym of *Cochlioda Noezliana.*

O. odoratum (*Lindl.*).—A somewhat variable species. The flowers resemble those of *O. nævium* in shape, and, as the name implies, they are very fragrant. The scape is erect, branched, and many-flowered. The sepals and petals are dull yellow, spotted and blotched with chocolate-brown, the edges being wavy; the lip is white, with a large purple blotch. This species is supposed to be one of the parents of many of the natural hybrids which have been introduced, such as *O. hebraicum*, *O. baphicanthum*, &c. It blooms at various times, but mostly in winter and spring. It is a native of Colombia and Venezuela, and should be grown in the cool-house. (B. M., t. 6502.)

O. Oërstedii (*Rchb. f.*).—In flowers this small but exceedingly pretty species comes near to *O. pulchellum.* It has roundish, compressed pseudo-bulbs, bearing only one leaf, which is about 4in. long. The spikes are short, erect, one- or two-, rarely four-flowered; flowers 1½in. across, full, pure white, except for a yellow spot on the base of the lip, which is broad and irregular-edged. Costa Rica, 1877. It flowers in the spring months. This little gem is found wild on mossy tree-trunks in constant moisture, where the temperature gets low at night. Under cultivation, it thrives when planted in shallow pans, and suspended close to the roof-glass in a cool, moist house. (B. M., t. 6820.)

Var. *major* has large flowers, of good substance, and usually produced in fours on a spike.

O. Pescatorei (*Lindl.*).—A synonym of *O. nobile.*

O. Phalænopsis (*Rchb. f.*).—A synonym of *Miltonia Phalænopsis.*

Odontoglossum.

O. platyodon (*Rchb. f.*).—A synonym of *O. Lindeni.*

O. polyxanthum (*Rchb. f.*).—A synonym of *O. Kegeljani.*

O. pulchellum (*Batem.*). — Deliciously fragrant, pure white flowers characterise this distinct and pretty little species. Pseudo-bulbs long, narrow, thin, and two-leaved. Leaves grass-like, rather stiff, 9in. to 12in. long. Flowers borne on erect spikes, suggestive of Lily of the Valley. There is a small, yellow blotch on the crest of the lip. The flowers are more fragrant at night



FIG. 119. ODONTOGLOSSUM ROSSII

(much reduced).

than in the day, and are developed in spring, lasting about six weeks. This species is easily grown, and never fails to flower. It likes plenty of moisture. Owing to the erect habit of the spikes, the flowers are arranged with the lip uppermost, and appear to be upside down. Guatemala, 1840. (Batem. Monog., t. 5.)

O. ramosissimum (*Lindl.*).—A distinct plant, with oblong, flattened pseudo-bulbs, each bearing a single leaf about 1ft. in length. Spike 3ft. or more long, branching, and bearing numerous

Odontoglossum.

flowers 2in. across, with narrow, wavy sepals and petals, and a narrow, reflexed lip; the colour is pure white, spotted with pale purple. Colombia, 1871. It should be grown in the cool-house, where its flowers are developed in March and April. The pretty, graceful flowers have been likened to large spiders.

O. Roezlii (*Rchb. f.*).—A synonym of *Miltonia Roezlii.*

O. roseum (*Lindl.*).—A synonym of *Cochlioda rosea.*

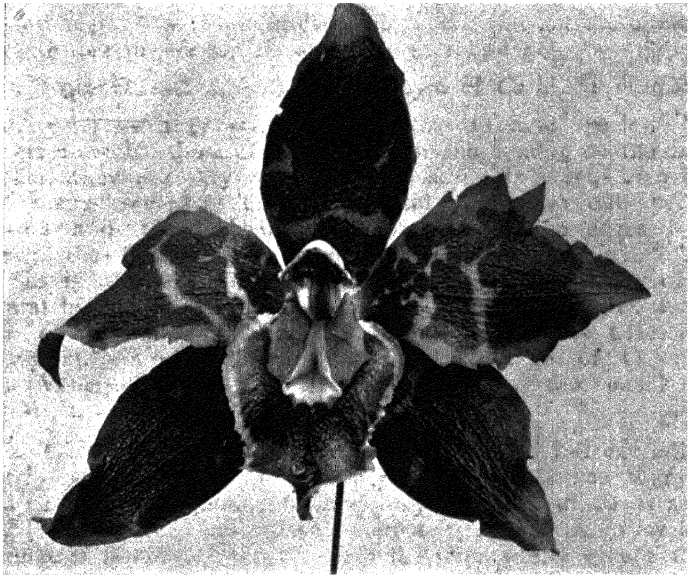


FIG. 120. FLOWER OF ODONTOGLOSSUM TRIUMPHANS LIONEL CRAWSHAY (nat. size).

O. Rossii (*Lindl.*).—One of the best and most popular of the smaller kinds. It grows and blossoms freely, and its beautiful and lasting flowers are produced during the winter months. It may be grown in an ordinary greenhouse along with *O. crispum*, &c. If we had to make a selection of six Odontoglossums, this would certainly be one of them. It has small pseudo-bulbs, with one short leaf each. The spikes are 6in. long, and bear two to five flowers, each 3in. in diameter; the sepals and petals are white

Odontoglossum.

or rose-tinted, the sepals spotted all over, the petals only at the base, with deep brown spots; the lip is large, somewhat heart-shaped, and pure white or rose. Mexico, 1842. (Fig. 119; B. R., xxv., t. 48.)

O. Sanderianum (*Rchb. f.*).—This is chiefly remarkable for its delicious, hawthorn-like fragance. The pseudo-bulbs are ovoid,

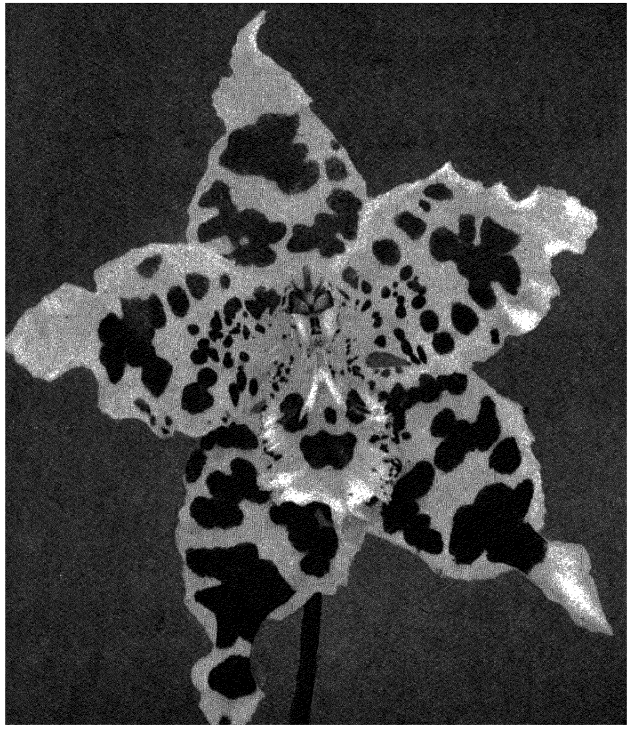


FIG. 121. FLOWER OF ODONTOGLOSSUM ADRIANÆ (nat. size).

compressed, two-leaved; the leaves are rather narrow, about 1ft. long. Flower-spikes drooping, bearing numerous rather small flowers, with narrow sepals and petals, which are yellow, blotched with brown; lip white or pale yellow, with a large purple blotch

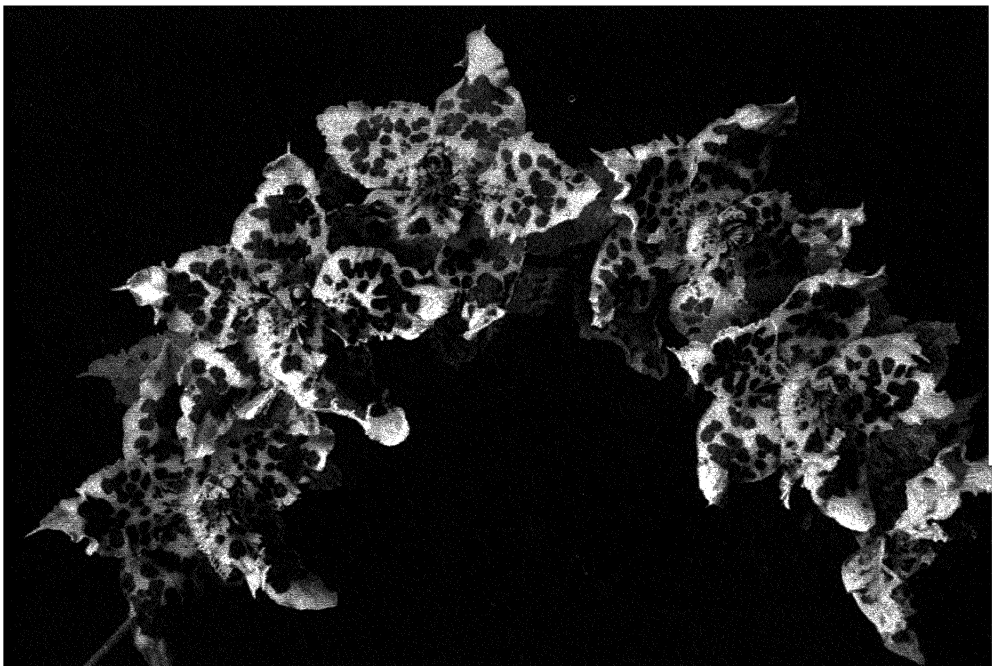


FIG. 122. FLOWER-SPIKE OF ODONTOGLOSSUM ADRIANÆ (COOKSON'S VAR) (much reduced).

in front. Introduced from Caracas in 1881. The flowers are produced in early spring. It should be grown in the cool-house, and always be kept moist. By some authorities this is regarded as synonymous with *O. constrictum.*

O. sceptrum (*Rchb. f.*).—A variety of *O. luteo-purpureum.*

O. Schlieperianum (*Rchb. f.*).—In habit of growth and general appearance this very useful species resembles *O. grande*; but the flowers, though like those of that species in form, are different in colour; they are borne upon erect scapes, several together, and are pale yellow, blotched and barred with a deeper shade of the same colour, or almost reddish-brown. A native of Costa Rica; introduced in 1856. It requires the same treatment as *O. grande.* Syn. *O. Insleayi macranthum* (under which name it was described by Lindley). (G., t. 605.)

O. Schrœderianum (*O'Brien*).—A synonym of *Miltonia Schrœderiana.*

O. tripudians (*Rchb. f.*).—A well-marked and free-flowering species, supposed to be of hybrid origin. In leaf-characters it resembles *O. nobile.* The spike is arching, rarely branched, and the flowers are 2½in. across, chestnut-brown and yellow, the former colour being in blotches; lip white, with a jagged edge, sometimes blotched with rose. Introduced from Colombia in 1869. When wild it is said to flower all the year round, but under cultivation it usually blooms only in autumn. It is somewhat variable in the markings of the flowers, and is not always admired. It requires cool treatment.

O. triumphans (*Rchb. f.*).—An easily-managed large-flowered species, and one of the most popular of the genus. Pseudobulbs 3in. to 4in. long, two-leaved. Leaves 1ft. to 1¼ft. long, bright green. Scape arching, many-flowered, branched, and from 2ft. to 3ft. in length. Flowers 3in. to 4in. across, thick in substance; sepals and petals bright yellow, blotched with deep brownish-crimson; lip oblong, with a narrow, tail-like tip, the edges toothed, the front portion being cinnamon-brown, and the basal half pure white, with a yellow centre; the crest, which is usually white, has two long teeth. The plant blossoms during March, April, and May. It should be grown along with *O. crispum* and *O. nobile*, with which it is often found associated in a wild state. It is a native of Colombia, where it was discovered by Linden in 1842, at an altitude of 8500ft.; it does not appear, however, to have been in cultivation in England till about twenty-five years afterwards. (Batem. Monog., t. 23.)

There are several varieties of this species, the most prominent being *O. t. aureum*, in which the yellow has suppressed the

brown markings, and *O. t. Lionel Crawshay* (Fig. 120), the finest flower for both form and substance yet seen among the hosts of plants of this species that have been imported.

O. Uro-Skinneri (*Lindl.*).—A large-growing species, with stout pseudo-bulbs, bearing two large, strap-shaped leaves, and an erect flower-scape, from 2ft. to 3ft. high. Flowers 2in. to 3in. across, chestnut-brown, mottled with green; lip pale rose, mottled with white. A native of Guatemala, whence it was sent



ANDERSONIANUM CRAWSHAYANUM

(much reduced).

by Mr. U. Skinner in 1854. It blooms in July and August, and requires cool treatment, with plenty of water. (Batem. Monog., t. 2.)

O. vexillarium (*Rchb. f.*).—A synonym of *Miltonia vexillaria.*

O. Wallisii (*Rchb. f.*).—A miniature-flowered species. Flowers variable; sepals brown, margined with yellow; petals yellow, potted with brown; lip white, with a rose blotch in the centre of the front part. It is a native of Colombia, and flowers in spring.

Odontoglossum.

GARDEN HYBRIDS.

ardentissimum *crispum Franz Mazreel* and *nobile* (Vuylsteke).
bellatulum *nobile* (*Pescatorei*) and *Septerum* (Vuylsteke).
Crawshayanum *Hallii* and *Harryanum* (Crawshay).
crispo-Hallii *crispum* and *Hallii* (Cookson).
crispo-Harryanum *crispum and Harryanum* (Vuylsteke).

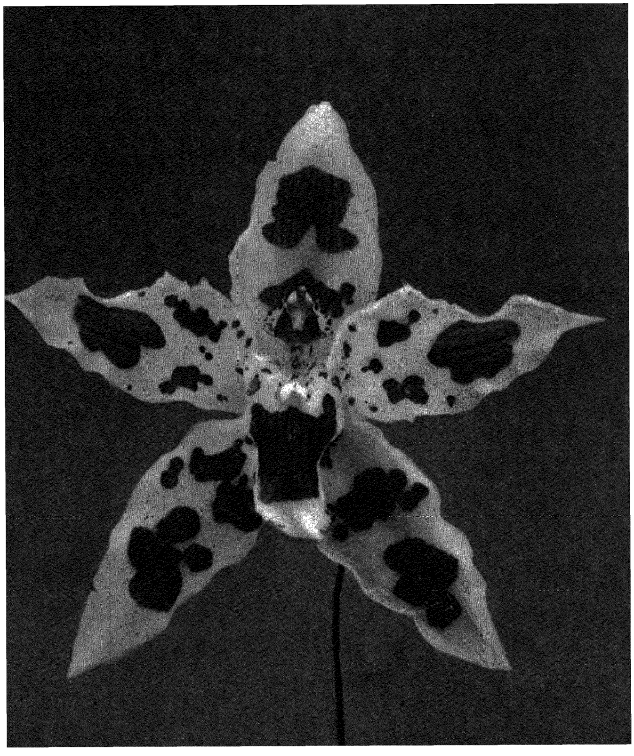


FIG. 124. FLOWER OF ODONTOGLOSSUM CORADINEI (nat. size).

excellens *nobile* (*Pescatorei*) and *triumphans* (Veitch).
Hallio-crispum *Hallii* and *crispum* (Cookson).
Harryano-crispum *Harryanum* and *crispum* (Vuylsteke).
Harryano-triumphans *Harryanum* and *triumphans* (Charlesworth).
heroganum *crispum* and *luteo-purpureum* (Leroy).
loochristiense *crispum* and *triumphans* (Vuylsteke).
Rolfeæ *nobile* (*Pescatorei*) and *Harryanum* (Vuylsteke).

Odontoglossum.

Souvenir de Victor Hye de Crom *Harryanum* and *luteo-purpureum* (Hye).
Vuylstekei supposed *triumphans* and *tripudians* (Vuylsteke).

NATURAL HYBRIDS.

acuminatissimum supposed *luteo-purpureum* and *Lindleyanum*.
Adrianæ (Fig. 121) .. supposed *crispum* and *Hunnewellianum*.
Adrianæ (Fig. 122) .. supposed *crispum* and *Hunnewellianum* (Cookson's var.).
Alexandra-Regina *Schlieperianum* and *grande*.
Andersonianum supposed *crispum* and *gloriosum*.
(One of the most varied plants in cultivation. Fig. 123 represents *O. A. Crawshayanum*, one of the most distinct and beautiful varieties of this Hybrid.)
aspersum supposed *maculatum* and *Rossii*.
baphicanthum Syn. *Andersonianum* var.

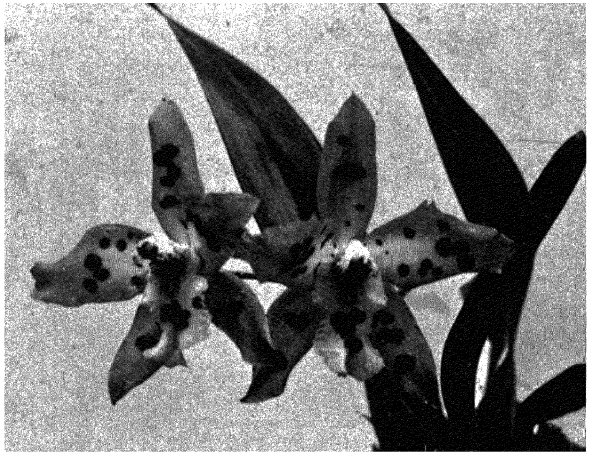


FIG. 125. FLOWERS OF ODONTOGLOSSUM EXCELLENS (much reduced).

Bergmanni Syn. *Wilckeanum* var.
Bickleyense Syn. *Wilckeanum* var.
Bleichræderianum Syn. *Andersonianum* var.
brachypterum *luteo-purpureum* and *nobile*.
Brandtii *luteo-purpureum* and *nobile*.
Brassia Syn. *Andersonianum* var.
chætostroma supposed *Hallii* and *cristatum*.
Clæsianum Syn. *Wilckeanum* var.
Cookianum supposed *blandum* and *triumphans*.
Coradinei (Fig. 124) .. supposed *crispum* and *Lindleyanum*.
cristatellum supposed *Kegeljani* and *cristatum*.
cuspidatum supposed *luteo-purpureum* and *gloriosum*.

Odontoglossum.

Dellense Syn. *excellens* var.
deltoglossum..... Syn. *Andersonianum* var.
Denisoniæ

(This is the original name given to the *luteo-purpureum* and *crispum* hybrid. The whole of the varieties of *O. Wilckeanum* should be placed under this heading; but as the latter name is retained in Odontoglossum collections generally, the purpose of this work will best be served by retaining them as *O. Wilckeanum*.)

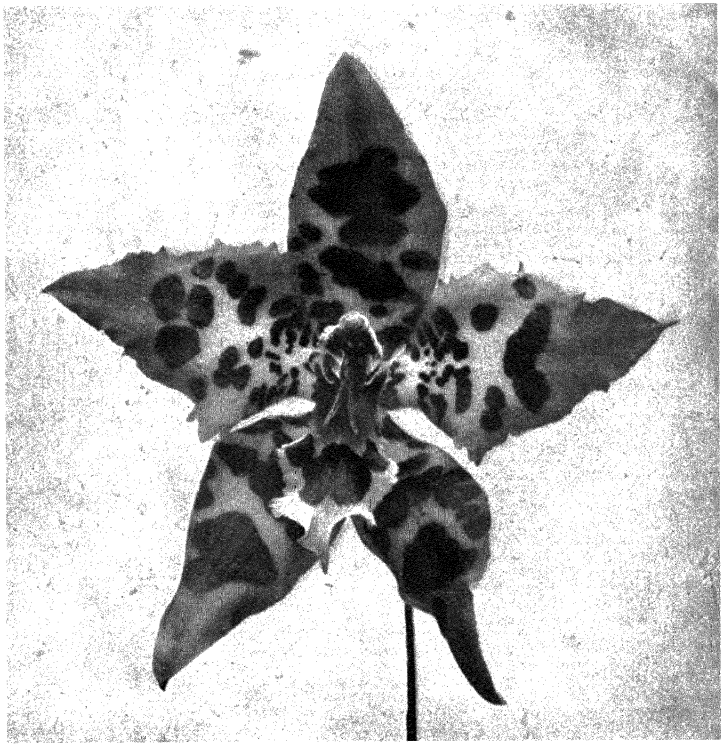


FIG. 126. FLOWER OF ODONTOGLOSSUM LOOCHRISTIENSE ROCHFORDIANA (much reduced).

dicranophorum supposed *triumphans* and *Lindleyanum*.
edithiæ..... Syn. *Andersonianum* var.
elegans supposed *cirrhosum* and *Hallii*.
elegantius..... supposed *nobile* and *Lindleyanum*.
eugenes..... Syn. *excellens* var.

Odontoglossum.

excellens (Fig. 125).... *nobile* and *triumphans.*
facetum supposed *luteo-purpureum*, *sceptrum*, and *Hunnewellianum.*
Hallii-xanthum supposed *Hallii* and *Kegeljani.*
hebraicum Syn. *Andersonianum* var.
Hinnus..... supposed *cirrhosum* and *cristatum.*
histrionicum Syn. *cuspidatum.*
Horsmanii supposed *luteo-purpureum* and *nobile.*

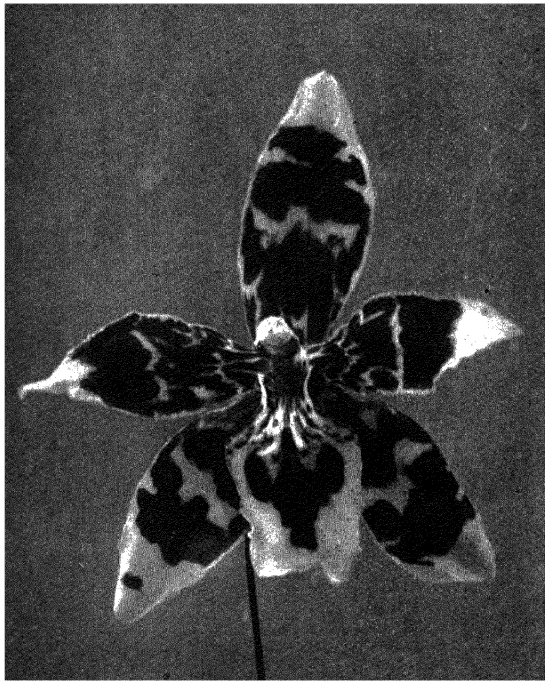


FIG. 127. FLOWER OF ODONTOGLOSSUM WATTIANUM (HARDY'S VAR.)
(nat. size).

Humeanum supposed *maculatum* and *Rossii.*
Inschootianum supposed *tripudians* and *Lindleyanum.*
Jenningsianum Syn. *Andersonianum* var.
Josephinæ Syn. *Andersonianum* var.
Leeanum supposed *gloriosum* and *triumphans.*
lepidum Syn. *acuminatissimum* var.
ligulare Syn. *Coradinei* var.
limbatum Syn. *Andersonianum* var.

Odontoglossum.

loochristiense (Fig. 126) *crispum* and *triumphans.*
lyroglossum Syn. *Wilckeanum* var.
macrospilum Syn. *Wilckeanum* var.
Marriottianum Syn. *elegans* var.
Measuresianum Syn. *Andersonianum* var.
Mulus supposed *luteo-purpureum* and *gloriosum.*
Murrellianum..... supposed *nobile* and *gloriosum.*
Pollettianum Syn. *Andersonianum* var.



FIG. 128. FLOWER OF ODONTOGLOSSUM WILCKEANUM

(much reduced).

prionopetalum..... Syn. *Wilckeanum* var.
Rochfordianum Syn. *Adrianæ* var.
Ruckerianum (Fig. 129) Syn. *Andersonianum* var.
Schræderianum supposed *nobile* and *tripudians.*
Scottii Syn. *Andersonianum* var.
Shuttleworthii..... Syn. *Wilckeanum* var.
Smeeanum Syn. *Wilckeanum* var.
Staurastrum Syn. *Imschootianum* var.

Odontoglossum.

Stauroides Syn. *elegantius* var.
stellimicans Syn. *excellens* var.
tentaculatum Syn. *cuspidatum.*
vexativum..... supposed *maculatum* and *apterum.*
Victor Syn. *elegans.*
Warnerianum..... supposed *apterum* and *Rossii.*
Wattianum (Fig. 127) *Harryanum* and *Lindleyanum.*
Wendlandianum..... supposed *crispum Lehmanni* and *cirrhosum.*
Wilckeanum (Fig. 128) supposed *crispum* and *luteo-purpureum.*

ONCIDIUM.

A very large number of epiphytes, belonging to the tribe *Vandeæ*, and exclusively natives of tropical America—being generally diffused from Mexico and the West Indies to Bolivia and Brazil—are included in this genus. The name given by Swartz is from *onkos*, a tumour, and is in reference to the warty crest on the base of the labellum. Over 256 species have been described, but it is questionable if the whole of these are distinct. No less than 180 of the number are supposed to be in cultivation in Europe—a fact which goes to prove that a large proportion of the plants are sufficiently ornamental for the garden. There are, however, many which, on account of their lack of size or of attractive colours, do not call for description here. We have selected about thirty distinct species as representative of the genus, and as comprising all that are worthy of being classed among first-rate garden Orchids.

Botanically considered, the genus is, with few exceptions, a natural one, of well-marked characters and easily distinguished from its allies, *Odontoglossum* and *Miltonia.* There are certainly links that connect these with each other. With regard to *Miltonia*, Reichenbach himself proposed to merge that genus in *Oncidium.* For garden purposes, however, this would have been a mistake, and it has never been insisted on. The floral characters that distinguish *Oncidium* are the short and thick column, with its two ear-like appendages, the lip forming an angle with the column, the usually warty crest on the latter, and its generally large, spreading front lobe. In habit, size, and shape of pseudo-bulb, in form and size of leaves, and in form of inflorescence, there is considerable variation amongst Oncidiums. The blossoms also vary

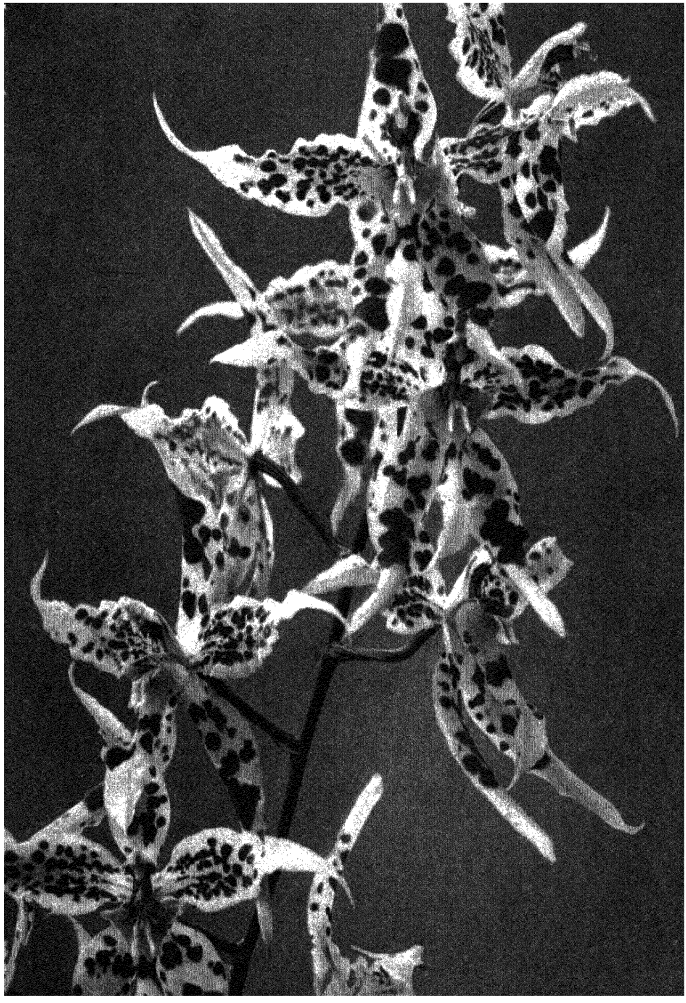


FIG. 129. FLOWER-SPIKE OF ODONTOGLOSSUM ANDERSONIANUM RUCKERIANUM

(much reduced).

from very small to large and showy ones; the arrangement and relative sizes of the different parts of the flower are equally diversified, and the colour ranges from yellow (the predominating hue) to brown, purple, white, and green.

The charm of the Oncidiums lies in their generally large spikes of bloom, their bright, attractive colours, and the beauty or peculiarity of the form of their flowers. The Butterfly Orchid (*O. Papilio*), with its singular form and rich coloration, so delighted the late Duke of Devonshire when he saw it in flower at Chiswick, soon after its first introduction, that he determined to form a special collection of Orchids at Chatsworth. This set the fashion of Orchid-growing that is now so prevalent. *O. crispum*, *O. Forbesii*, *O. Lanceanum*, *O. macranthum*, *O. Marshallianum*, *O. tigrinum*, and *O. varicosum*, are amongst the most effective Orchids grown for exhibition. Even the smaller and less showy kinds are possessed of beauty and interest that entitle them to a place in all good collections. Moreover, the flowers remain fresh for a very long time, and are often fragrant.

Culture.—Their wide range of distribution, and the difference in regard to the climatic and atmospheric conditions in which they grow wild, make it impossible for gardeners to accommodate all the popular Oncidiums in one house. The few distinctly tropical species, represented by *O. Jonesianum*, *O. Lanceanum*, and *O. Papilio*, can only be grown in a hot, moist stove, where they must remain all the year. A considerable number of others require the temperature of the intermediate-house, with moisture at all times. The great bulk of the cultivated species may, however, be grown in the cool-house, or greenhouse, with treatment similar to that recommended for the Odontoglossums. The largest and most robust-growing species may be planted in well-drained pots or pans, in a mixture of peat and sphagnum. For others, pots, baskets, rafts, or blocks are used, according to the supposed requirements of the different kinds. It is not, however, very material which is adopted, provided such important conditions as moisture, sweetness, ventilation, and freedom from insects, are not neglected. *Palumbina* and *Cyrtochilum* are now included with this genus.

Oncidium.

With few exceptions, the species selected here are not difficult to cultivate. Their special requirements are dealt with under the descriptions.

O. ampliatum (*Lindl.*).—When in good health this large-bulbed, leathery-leaved species produces a magnificent inflorescence. The pseudo-bulbs are large, spheroid, compressed, bright green, with purple spots when young, becoming blackish-purple and wrinkled with age. The leaves are 1ft. long, 4in. wide, glossy green, and leathery. The flower-spike, which springs from the base of the matured pseudo-bulb, is from 1ft. to 3ft. long, branched, and many-flowered. The flowers have small sepals and petals; the lip is spreading, reniform, wavy, 1½in. across, narrow at the base, with two small lateral lobes, and a prominent two-lobed crest. The colour of the sepals is yellow, with red spots, and there are a few red spots about the base of the petals and lip, the rest being a bright yellow; the colour of the back of the flowers is much paler than that of the front. This species requires a tropical temperature, plenty of light, and moisture when growing. It should be planted in well-drained peat and sphagnum, and may be grown either in pots, in baskets, or on blocks. It is a native of Central America, and was introduced in 1832. The flowers vary in size, those of a form called *majus* being half as large again as those of the type. Flowering season, March to May. (B. R., t. 1699.)

O. aurosum (*Rchb. f.*).—A synonym of *O. excavatum.*

O. barbatum (*Lindl.*).—In this distinct and variable species some of the varieties have green, lanceolate petals, barred with brown like the sepals. Flowers 1½in. to 2in. across, but variable as to size; sepals lanceolate, with wavy pale yellow margins, barred with chestnut-brown; lateral sepals connate for half their length; petals oblong, with wavy golden margins, streaked at the base with crimson; lower lip triangular; lateral lobes clear golden-yellow; margins of the discal portions fimbriate, and spotted with brown; apical lobe rhombiform and clear yellow; spike from 1ft. to 3ft. long, produced in summer. Pseudo-bulbs roundish, ovoid, with a well defined central ridge, one-leaved. Brazil, 1818.

O. Brunleesianum (*Rchb. f.*).—A distinct and beautiful though scarce species, with the habit of *O. sarcodes.* Pseudo-bulbs erect, cylindrical, each with a pair of oblong, acute, dark green leaves. The flowers are very numerous, on erect, branching spikes, 150 having been produced on one spike by the plant that first blossomed in England; the sepals and petals are

almost equal, oblong, ½in. in length, not spreading as in the majority of Oncidiums, primrose-coloured; the petals are yellow, barred with brown; the lip, which is the showiest part of the flower, is three-lobed, the two lateral lobes being yellow, folding and almost forming a tube, whilst the front lobe is tongue-like, recurved, and coloured a rich maroon. This remarkable plant was introduced by accident amongst some mixed Orchids brought by an engineer from Brazil in 1883. It flowered in 1885, and created quite a sensation amongst Orchid-growers. A portion of the plant was, it is stated, soon after purchased from its lucky possessor for 150 guineas. It blossoms in the spring, and requires the same treatment as *O. sarcodes*. (W. O. A., v., t. 206.)



FIG. 130. FLOWERS OF ONCIDIUM CANDIDUM (nat. size).

O. candidum (*Rchb. f.*).—This somewhat remarkable little plant was once known as *Palumbina candida*. It has flattened, oblong, smooth, one-leaved pseudo-bulbs, 2in. long. Leaves ensiform, 6in. to 9in. long, ½in. wide, keeled and sharp-pointed. Flower-spikes developed with the new growth, erect, wiry, about 1ft. long, usually six-flowered; each flower is about 1½in. long; upper sepal ovate, concave, ½in. long, the two lower ones united, also concave; petals ovate, ½in. long, flat; lip almost triangular, ½in. by ¾in., the crest almost lost in the base of the column. The colour of the whole flower is white, tinted with purplish-rose. Botanically, this is one of the most interesting of Oncidiums; it is also sufficiently ornamental to be included in good collections. It thrives under cool treatment, and should never be rested. Mexico, 1843. (Fig. 130; B. M., t. 5546, as *Palumbina candida*.)

Oncidium.

O. cheirophorum (*Rchb. f.*).—Of the small-flowered Oncidiums this is one of the most popular. It has small, sweet-scented flowers, borne on elegant scapes. The pseudo-bulbs are 1in. long, ellipsoid, compressed, smooth, wrinkled when old. Leaves about 5in. long, narrow, grass-like, bright green. Scape very slender, 6in. to 9in. long, freely branched, and crowded with bright yellow flowers, each less than ½in. across; sepals and petals nearly equal, almost round, reflexed, concave; lip much larger than the other parts, three-lobed, with a central callus of irregular form; column thick, conspicuously winged. This species thrives in a cool intermediate moist house. Small pans filled with peat-fibre, sphagnum, and crocks, suit it best, and it should be hung close to the roof-glass. Colombia, 1852. It blossoms in December and January. (B. M., t. 6278.)

O. concolor (*Hook.*).—One of the most attractive of yellow-flowered cool-house Orchids, its graceful, pendent racemes of bright-coloured flowers being particularly ornamental. The pseudo-bulbs are 1½in. long, oval, flattened, furrowed, sheathed at the base, and each bearing a pair of strap-shaped, pointed, bright green leaves, 6in. to 9in. long. The flower-scape is 1ft. or more in length, arched or pendent, and bears numerous flowers, each nearly 2in. across, and of a pure canary-yellow; upper sepal and two lateral petals 1in. long, ovate, and pointed; two lower sepals partly united and pointing downwards; lip nearly 2in. long, 1½in. broad, flat, slightly lobed, and having a pair of raised, reddish ridges running down into the base; column winged, tipped with orange. When planted in a basket, or on a raft, and placed in a cool, moist house, this species grows freely, and blossoms profusely from April to June. Organ Mountains, Brazil, 1837. Syn. *Cyrtochilum citrinum.* (B. M., tt. 3752 and 4454.)

O. cornigerum (*Lindl.*).—An easily-grown, compact, free-flowering species, related to *O. curtum.* Pseudo-bulbs sulcate, 3in. long, one-leaved. Leaf thick and fleshy, broadly ovate, 4in. long, dark green. Flower-spike thin, about 1½ft. long, branched and crowded with flowers on the upper half. Flowers bright yellow, with bands of red-brown, small, but sufficiently numerous to make a fine display; sepals and petals ⅓in. long, ovate, incurved; lip fiddle-shaped, with long, narrow side lobes, and a pair of projecting, horn-like processes at the base. Grown in a basket suspended so that the spikes hang down over the sides, this plant is really attractive. It should be treated as advised for *O. crispum.* It blossoms in April and May. Brazil, 1829. (B. M., t. 3486.)

Oncidium.

O. crispum (*Lodd.*).—An old favourite, and still one of the very best garden Oncidiums. It is easy to manage, blossoms freely, and is abundant enough to be always cheap. The pseudo-bulbs spring from a stout, creeping rhizome, and are broadly ovate, flattened, deeply furrowed, rough, and usually dark brown in colour. The leaves are in pairs, and are about 9in. long by 1½in broad, leathery, deep olive-green. Flower-spike stout, arched, branched, bearing from twenty to fifty flowers, each from 1½in. to 3in. across, and coloured deep shining brown, with a few yellow and reddish marks on the lower parts of the segments; sepals and petals large, oblong, narrow at the base, rounded at the apex, the margin crisped and wavy; lip almost circular, stalked, with two horn-shaped side lobes, and a three-lobed, warted, yellow crest; column yellow, with red wings. This plant may be grown in a basket in the intermediate-house. It requires very little material about its roots. When growing, it enjoys an abundance of moisture, with plenty of light; during winter it requires less water, but should never be dried. If leaf-soil is used in place of peat, it should be pressed firmly about the roots, and the surface should be covered with living sphagnum. The whole of the Brazilian Oncidiums do well in leaf-soil. *O. crispum* blossoms at various seasons; the flowers last about a month. Brazil, &c., about 1830. (B. M., t. 3499.)

Var. *grandiflorum* has very large flowers, the segments being edged with yellow.

O. Cœsus (*Rchb. f.*).—A small but pretty species, of tufted habit, and bearing flowers of pansy-like nature. By some authorities it is regarded as a variety of *O. longipes*. It has narrow, sulcate pseudo-bulbs, 1in. long, with a distinct neck, supporting a pair of light green, strap-shaped leaves 4in. long. The flower-spike is semi-erect, shorter than the leaves, and bears from three to six flowers, each 1½in. across. Sepals and petals oblong, spreading, reddish-brown, the margins recurved; lip three-lobed, the two lateral lobes being almost round, and the middle and larger one reniform, ¾in. across, rich golden-yellow, with a large, eye-like blotch of black-purple about the prominent, toothed crest. This is a delightful little plant when well managed. When grown at the warm end of the Odontoglossum-house, or in the intermediate-house, and suspended near the roof-glass, it usually thrives; it should be planted in shallow pans or teak baskets, in a mixture of good peat and sphagnum, and it likes plenty of water and fresh air in summer. Leaf-soil may also be used with advantage as a potting compost for this species. The blossoms are produced

Oncidium.

in July. Brazil, 1872. (Fig. 131, for which we are indebted to the Editor of "The Garden"; B. M., t. 5193.)

O. cucullatum (*Lindl.*).—A small but pretty-flowered Orchid, showing considerable variety in both form and colour. The pseudo-bulbs are oval, about 1½in. long, smooth, becoming furrowed with age, one-leaved. Leaf 6in. long, ¾in. wide, rather stiff, pointed, dark green. Flower-scape erect, wiry, 8in. to 12in. long, bearing from six to twelve flowers, each 1½in. across;



FIG. 131. ONCIDIUM CRŒSUS
(¾ nat. size).

sepals and petals small, oval, concave, rose-purple; lip large, spreading, two-lobed, the edges unbroken, with a small, fleshy crest, white or rose, and spotted with dark purple. The flowers are developed in spring, and remain fresh for a long time. This is one of the coolest of the Andean Orchids, and thrives best when planted in shallow pans or baskets, and kept in a well-ventilated, moist greenhouse. It likes moisture at the root always. A native of Colombia, where it is found at an elevation of 13,000ft. It is now considered as identical with *O. olivaceum*, but being so

well known in gardens under the above name, we think it best to retain it. (P. F. G., iii., t. 87.)

Var. *Chestertoni.*—Sepals and petals narrow; lip with two prominent side lobes and a long waist, and of a pale colour, with crimson spots.

Var. *flavidum.*—Sepals and petals yellow, with brown blotches; lip purple, margined with white.

Var. *macrochilum.*—This is larger in all its parts than the type, and the flowers are plum-colour, having a labellum of mauve, with violet spots.

Var. *nubigenum.*—Lip white, with a large, purple blotch about the crest. (B. M., t. 5708.)

Var. *Phalænopsis.*—A pretty variety, with flowers nearly as large again as those of the type; the parts being pure white, with purple blotches. Syn. *O. Phalænopsis.*



FIG. 132. DETACHED FLOWER OF ONCIDIUM CURTUM (nat. size).

O. curtum (*Lindl.*).—In habit this ornamental, free-flowering species is similar to *O. crispum*, the pseudo-bulbs and leaves of these two being very much alike. The inflorescence is an erect, freely-branched panicle, bearing numerous flowers of medium size; sepals and petals similar, ob-ovate-obtuse, wavy, yellow, with reddish bars and blotches; lip roundish, bilobed, nearly 1in. across, wavy, bright yellow in the middle, brown round the outside; crest lobed and warted, yellow, with reddish spots. The flowers are developed in spring, and remain in beauty for several weeks. The plants may be grown as advised for *O. crispum.* A native of Brazil, whence it was introduced by Veitch in 1841. (Fig. 132, for which we are indebted to the Editor of "The Garden"; B. R., 1847, t. 68.)

O. dasystyle (*Rchb. f.*).—An elegant little Orchid, the large, black-purple callus on the labellum being not unlike the distinguishing feature of our native Bee Ophrys. The pseudo-bulbs are oval, compressed, 1½in. long, at first smooth, becoming furrowed with age, and each bearing a pair of keeled,

Oncidium.

bright green leaves 5in. by 1in. The slender scape springs from the base of the ripened pseudo-bulb, and is about 8in. long; it bears from five to fifteen flowers, each 1½in. across. Sepals and petals nearly equal, ½in. long, pale yellow, with purplish blotches; lip spreading, kidney-shaped, with a short, stalk-like claw, the edges wavy, and the colour pale yellow; crest large and prominent, two-lobed, smooth, shining dark purple; column short, with a pair of



FIG. 133. FLOWERS OF ONCIDIUM EXCAVATUM (nat. size).

rounded wings. Brazil, 1872. This species should be grown on a block of soft wood, and a little sphagnum should be placed about its roots. It likes plenty of moisture whilst growing, but should be rested fairly dry. A position near the glass in the cool intermediate-house suits it best. (B. M., t. 6494.)

O. divaricatum (*Lindl.*).—Pseudo-bulbs round, much compressed. Leaves 9in. to 15in. long, broad, leathery. Scapes slender,

Oncidium.

5ft. long, branched, many-flowered. Flowers about 1in. in diameter; sepals and petals chestnut-brown, tipped with golden yellow; superior lobe of the lip yellow, with a chestnut blotch in the centre; large side lobes yellow, spotted with chestnut-brown; crest cushion-like. A summer-flowering species. Introduced from Brazil in 1826.

O. excavatum (*Lindl.*).—A very handsome plant, of large size and of easy culture. Its pseudo-bulbs are from 3in. to 5in. long, ovate-oblong, compressed, shining green. The leaves are in pairs on the tops of the pseudo-bulbs, and there are also several from the base of each; they are 1½ft. long, 1½in. broad, leathery and shining. The stout, branched scapes are from 3ft. to 5ft. long, and bear a great number of bright-coloured flowers, each 1½in. across; the sepals are smaller than the petals, and alternate with them; the lip is three-lobed, with several broken ridges near the base forming the crest. The colour of the whole flower is rich golden-yellow, with a few dark cinnamon spots on each segment. Strong plants of this species have produced as many as a hundred flowers on one scape. Being a robust grower, it likes plenty of pot-room, liberal supplies of water at the root, and an ordinary greenhouse temperature. Peru, 1839. Syn. *O. aurosum.* (Fig. 133; B. M., t. 5293.)

O. flexuosum (*Sims*).—One of the easiest Oncidiums to cultivate. It has ovate, flattened, furrowed pseudo-bulbs, 2in. long, each bearing two oblong or strap-shaped, bright green leaves, about 6in. long. Flower-spike large, branching, many-flowered. Flowers scarcely 1in. across; sepals and petals very small, recurved, yellow, with chestnut bars; lip yellow, with a few reddish freckles, ¾in. across, reniform, with a narrowed base, a pair of short lateral lobes, and a prominent, warted, cushion-like crest. This species flowers freely at various seasons, and the blossoms remain fresh for several weeks. It should be planted in a pot or a basket, in peat-fibre and sphagnum, and be kept constantly moist. It grows and flowers regularly under intermediate-house treatment. Brazil, 1818. (B. M., t. 2203.) There are several varieties of *O. flexuosum*, that differ from the type here described in being larger-flowered or more copiously spotted.

O. Forbesii (*Hook.*).—One of the most ornamental of all Oncidiums, but it is unfortunately rare in cultivation. The somewhat similar species *O. crispum* is often grown under this name. *O. Forbesii* has oval, flattened, furrowed pseudo-bulbs, with brownish, basal sheaths and leathery, dark green, strap-shaped leaves about 9in. long. The scape is about 1ft. long,

Oncidium.

branched, and crowded with flowers each 2in. across; sepal ovate, ½in. long; petals 1in. long, tongue-shaped, wavy, with a stalk-like base; lip three-lobed, 1in. long, the side lobes small the other spreading, fan-shaped, and wavy. The colour of the whole flower is rich, glossy, reddish-brown, with an irregular margin of yellow; the tubercled crest is spotted with red Introduced from Brazil to the Duke of Bedford's collection



FIG. 134. INFLORESCENCE OF ONCIDIUM FORBESII (much reduced).

at Woburn in 1837, and named in compliment to his gardener Mr. Forbes, who was one of the most skilful Orchid-growers of his day. The cultural requirements are similar to those for *O. crispum*. The blossoms are produced in autumn, and remain fresh a long time. "This species is far more variable than the good old *O. crispum*, and even than *O. prætextum*," according to the younger Reichenbach. (Fig. 134; B. M., t. 3705.

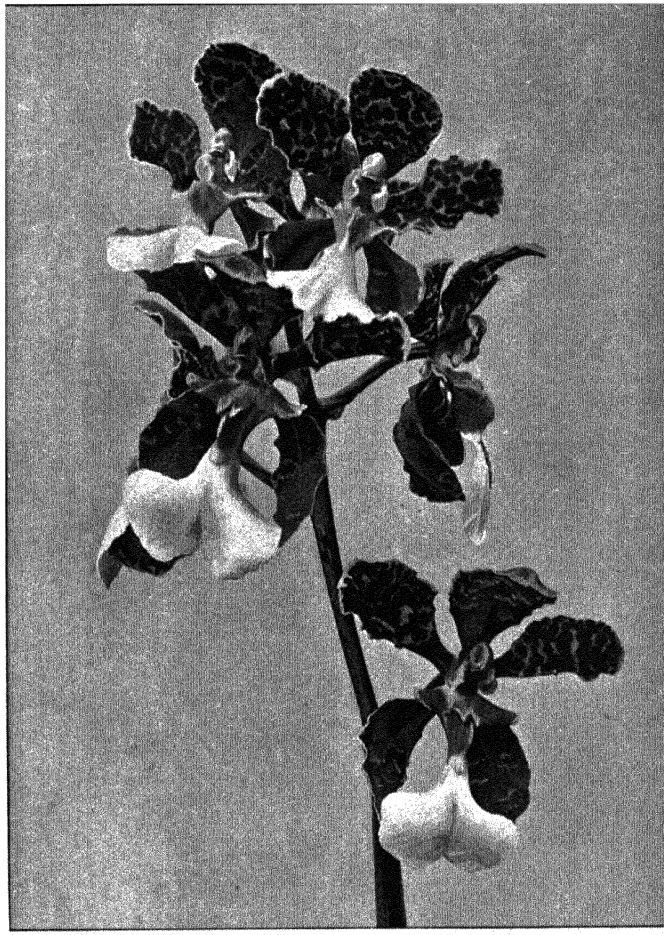


FIG. 135. PORTION OF FLOWER-SPIKE OF ONCIDIUM LANCEANUM (much reduced).

Oncidium.

O. fuscatum (*Rchb. f.*).—A synonym of *Miltonia Warscewiczii.*

O. hæmatochilum (*Lindl.*).—A large-leaved, bulbless species, with an erect spike of brightly-coloured flowers. It is closely related to *O. Lanceanum*, and is almost as ornamental as that species. The leaves are oblong, flat, thick, stiff, 6in. to 9in. long, about 2in. broad, dark green, with dull brown spots. The flower-spike is erect, compact, 1ft. to 2ft. long, and bears from ten to thirty flowers, each 1¾in. across; sepals and petals equal, nearly 1in. long, spathulate, wavy, greenish-yellow, with spots of rich cinnamon; lip narrow at the base, and eared, the front part spreading, oval, ¾in. wide, undulated, with a hump-like crest; colour bright crimson, with marginal spots of a deeper colour. This distinct plant requires the same treatment as is recommended for *O. Lanceanum.* It blossoms in November. A native of Trinidad, and introduced in 1847. (W. O. A., i., t. 32.)

O. incurvum (*Barker*).—A distinct and pretty-flowered plant, of easy culture. It is one of the best of the smaller-flowered species. The habit is similar to that of *O. ornithorhynchum*, but more robust. The pseudo-bulbs are ovate, compressed, furrowed, 2in. long, two-leaved. The leaves are ensiform, about 9in. long, acute-pointed, dark green. The flower-spikes are 3ft. or more long, much-branched, gracefully arched, and many-flowered; flowers 1½in. across; sepals and petals narrow, wavy, free, ¾in. long, white, banded with rosy-purple; lip three-lobed, narrow in the middle, the lobes concave, pure white; crest fleshy, five-toothed. The flowers are fragrant, and remain fresh for about a month. Well-grown examples of this species are not uncommon in collections, and when bearing their numerous spikes of pretty flowers in autumn are very ornamental. The plant requires cool-house treatment, thriving when grown in a pot of peat and sphagnum, and supplied with moisture at all times. (B. M., t. 4824.)

Var. *album* has flowers wholly white, save for the yellow disk on the base of the labellum.

O. Jonesianum (*Rchb. f.*).—Considerable variety in the size and marking of the flowers characterises this beautiful, distinct, and very effective plant. It has scarcely-perceptible pseudo-bulbs, and thick, fleshy, rush-like leaves, which usually hang downwards, and are from 3in. to 12in. long. The flower-spikes are developed from the base of the last-matured growth, and vary in length from 6in. to 2ft. The strongest spikes bear as many as a dozen flowers, each of which is 2in. across; sepals and petals equal, oblong, wavy, 1½in. in length,

Oncidium.

and coloured creamy-white, with large spots of chestnut; lip large, broad, flat, with small, serrated, yellow side lobes, the blade white, with a few crimson spots towards the base; crest composed of numerous yellow tubercles. When first introduced it was treated as a cool-house plant, but it thrives best when grown on blocks in a moist tropical house, in a rather sunny position. Its flowers are developed at various times, usually in autumn and winter. Paraguay, 1883. (B. M., t. 6982.)

O. Kramerianum (*Rchb. f.*).—In gardens usually regarded as a variety of *O. Papilio*, but by botanists as a distinct species.

O. lamelligerum (*Rchb. f.*).—Flowers—dorsal sepal kidney-shaped, wavy, stalked, deep brown, bordered with yellow; lower sepals longer, stalked, oblong, unequal at base; petals broadly clawed, yellowish, patched with brown. Ecuador, 1876.

O. Lanceanum (*Lindl.*).—As a garden plant this beautiful, fragrant, and large-flowered species, has a bad reputation. It has no pseudo-bulbs, the leaves springing directly from a stout rhizome. Each leaf is 1ft. or more in length, about one-fourth as broad, thick, leathery, green, thickly spotted with brown. The flower-spike is stout, erect, branched, 1ft. or more in height, and bears numerous flowers, which are from 2in. to 3in. across; sepals and petals equal, ovate, 1in. long, fleshy, yellow, barred and blotched with chocolate-brown; lip 1½in. long, narrowed and waist-like in the middle, the apex spreading and flat, 1in. broad; colour variable, but usually rosy at the base and violet on the broad part. The flowers remain fresh about a month. The plant requires moist, tropical treatment, except during the two or three winter months, when a dry position in the intermediate-house is best. It should be planted in well-drained baskets or pans, in a mixture of peat and sphagnum. It likes a very high temperature whilst making new growth. Unfortunately, it is often badly affected by "Spot," and soon gets too weak to make good growth. It flowers usually in summer. Dutch Guiana, 1834. (Fig. 135; B. R., t. 1887.)

O. leucochilum (*Batem.*).—An old favourite, of noble habit, beautiful in flower, and showing considerable variation. Pseudo-bulbs ovate, flattened, furrowed, 2½in. long, one- or two-leaved. Leaves 9in. long, 1in. broad, pointed and recurved. Flower-spikes long, arching, panicled; flowers numerous, 2in. across, with equal sepals and petals, oblong in shape, 1in. in length, and coloured yellowish-green, with blotches of dark brown; lip kidney-shaped, ¾in. across, with a red, stalk-like base, the blade two-lobed, pure white, turning to yellow with age, the two small



FIG. 136. FLOWERS OF ONCIDIUM MACRANTHUM

(much reduced).



ODONTOGLOSSUMS WILCKEANUM AND EXCELLENS.

lateral lobes also white; crest composed of several parallel ridges. The colours vary in different plants. This species blossoms at various times, and lasts for several weeks in beauty. It requires cool-house treatment, and, being a strong grower, thrives best when planted in a pot in a mixture of peat and sphagnum. Mexico, 1835.

O. macranthum (*Lindl.*).—This species ranks with the very best of garden Orchids. It is a robust grower, thrives in a cool house, and produces long spikes of very large, ornamental, and remarkably-formed flowers in spring. Its only fault is its somewhat shy-flowering nature. The pseudo-bulbs are ovate, laterally compressed, 3in. to 4in. long, furrowed and wrinkled when old, two-leaved. Leaves leathery, strap-shaped, about 1ft. long, 2in. broad, acute-pointed. Flower-spike from 6ft. to 12ft. long, twining, strong spikes bearing as many as seventy flowers, each of which is 4in. across; sepals narrow at the base, then becoming broadly ovate, crisp, and wavy, 1in. broad, and 1½in. in length, coloured bright yellowish-brown; petals similar in shape, but broader, and coloured rich golden-yellow; lip small, triangular, leathery, purple, with a white crest, which consists of a prominent keel with two acute teeth on either side. This species likes plenty of moisture at all times. It should be planted in a pot, the compost being as for *Odontoglossum crispum*. Tropical America, 1867. (Fig. 136; B. M., t. 5743.)

O. Marshallianum (*Rchb. f.*).—When not in flower this superb plant bears a close resemblance to *O. crispum*—so close, indeed, that the latter is sometimes imported and sold for the former. The resemblance does not, however, extend to the flowers. Pseudo-bulbs oblong, from 2in. to 3in. long, compressed, furrowed when old, two-leaved. Leaves strap-shaped, 6in. to 8in. long, about 2in. broad, bright green, leathery. Flower-spikes stout, 1ft. to 2ft. long, branched; flowers numerous, 2½in. across; sepals ovate and concave, ½in. long, yellow, with purplish bands; petals 1in. long, fiddle-shaped, wavy, two-lobed, and coloured deep golden-yellow, with large blotches of chocolate-brown along the middle; lip spreading, nearly 2in. across, irregularly notched, suddenly contracted towards the base, where there are two ear-like lobes; colour bright yellow, with spots of orange-red about the base; crest formed of fleshy tubercles. No Oncidium is more effective than this when it is well managed, the flowers lasting a long while, and being very bright in colour. It should be grown on teak blocks or in baskets, in a mixture of peat-fibre and sphagnum, and

Oncidium.

placed in the cool intermediate-house, where it should have plenty of light and moisture when growing. It blossoms in May. Brazil, 1865. (B. M., t. 5725.)

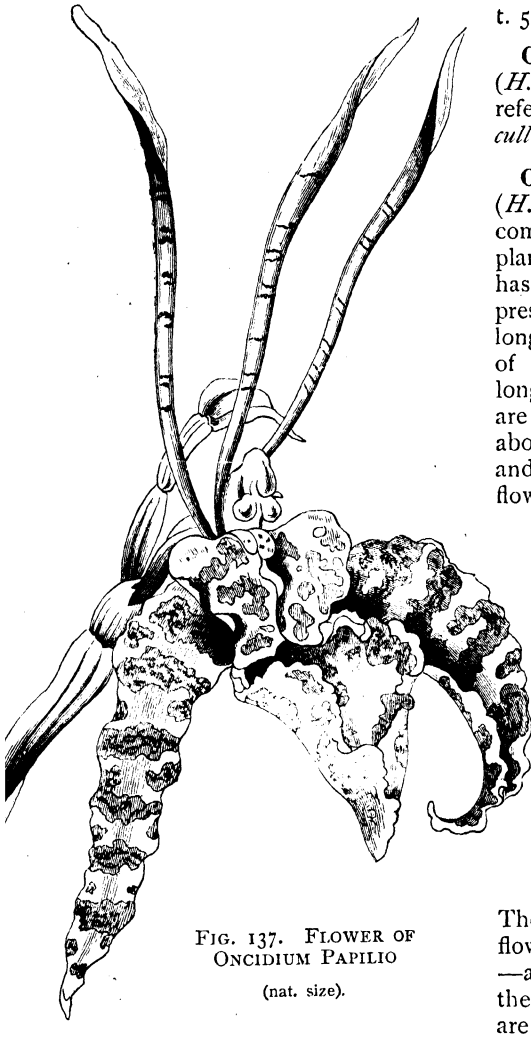


FIG. 137. FLOWER OF ONCIDIUM PAPILIO (nat. size).

O. olivaceum (*H. B. K.*).—This is referred to under *O. cucullatum.*

O. ornithorhynchum (*H. B. K.*).—A dwarf, compact, free-flowering plant, of easy culture. It has smooth, ovate, compressed pseudo-bulbs, 2in. long, each bearing a pair of grass-like leaves 10in. long. The flower-scapes are thin and arched, about 1ft. long, branched, and many-flowered. The flowers are barely 1in. across; sepals and petals small, oblong, wavy; lip three-lobed or fiddle-shaped, the lateral lobes small and notched, the middle lobe much the largest, split at the apex, and bearing a conspicuous warty, five-ridged crest; column short, with a long, curved rostellum. The colour of the whole flower is soft rose-purple—a most unusual one in the genus. The flowers are developed during the autumn and winter, and exhale a sweet, hay-like perfume for the whole month or so during which they last. This species may be grown in the Odontoglossum-house. It likes shade

and moisture at all times. A native of Mexico and Guatemala, 1836. (B. M., t. 3912.)

Var. *albiflorum* has white flowers, with a yellow crest, and does best when grown slightly warmer than the coloured variety.

O. Papilio (*Lindl.*).—The Butterfly Orchid is very remarkable in form, even for an Orchid, whilst in beauty it ranks among the best. The pseudo-bulbs are roundish, compressed, wrinkled, and so crowded as to overlap each other; they are one-leaved, each leaf being from 6in. to 8in. long, 2in. broad, leathery, and deep olive-green, mottled with reddish-brown. The flower-scape is basal, from 2ft. to 3ft. long, flexuose, jointed, flattened, winged, with a sheath at the top, from which the flowers spring, one at a time. The three sepals are all erect, 3in. long, narrow, and purplish-coloured; the two lateral petals are oblong, crisp-edged, curved downwards, about 2in. long, bright yellow, with bands and blotches of red; the lip is stalked, with a roundish blade, 1½in. across, very wavy and crisped at the edge, yellow, mottled or margined with bright cinnamon-brown; the column is short and winged. This plant is common in the West Indies and Venezuela, growing upon trees, and producing a very fine effect when in flower. Under cultivation here it is almost always in blossom, the same scape continuing to develop flowers for several years. It requires tropical treatment, with plenty of moisture and sunlight all the year round, and thrives best when grown in a basket. It should have a little sphagnum about its roots during the growing season. Should the plants get weak, it is a good plan to remove all the flower-spikes and encourage new growth. This species is interesting on account of its having been the first Orchid to find much favour among horticulturists. Trinidad, 1823. (Fig. 137; B. M., t. 2795.)

Var. *Eckhaudtii* is remarkable for its large flowers, having a lip coloured yellow, with an orange-red border.

Var. *Kramerianum*.—When healthy, this fine plant has leaves about 1ft. long, by 4in. wide, beautifully mottled with cinnamon. The flowers are large; the sepals and petals are rich golden-yellow, with reddish blotches; the lip is pale yellow, with a zone of reddish spots near the margin. The scape is round, not flat as in *O. Papilio*. Ecuador, 1854.

O. Phalænopsis (*Rchb. f.*).—Though regarded as distinct by Kew, this is scarcely distinguishable from the varieties of *O. cucullatum* (*violaceum*).

O. Rogersii (*Hort.*).—A variety of *O. varicosum*.

O. sarcodes (*Lindl.*).—A handsome-flowered, easily-grown plant, very similar in habit to *O. curtum*. The pseudo-bulbs

are finger-like, 3in. to 5in. long, dark green, each bearing a pair of leathery, shining green leaves, 6in. to 9in. by 2in. The flower-spike is from 2ft. to 5ft. long, branched, and many-flowered; the flowers are variable in size, the finest being 2in. across; sepals obovate; petals ¾in. broad; lip broad and wavy; colour bright yellow, with blotches of brown-red, the blotches being thickest on the petals, whilst on the lip there are only a few near the base. This plant should be in every collection, as it is easily managed and very floriferous when in health. It may be grown in baskets or pots in an intermediate-house temperature. The flowers are produced in spring. Introduced from Brazil in 1849. (W. S. O., i., t. 23.)

O. serratum (*Lindl.*).—This very handsome, large-flowered species is remarkable for its long, twining flower-spike. Pseudo-bulbs flask-shaped, from 4in. to 6in. long, partly inclosed in sheathing leaves till old. Leaves broad, leathery, 1ft. or more in length, 2in. broad, arched, bright green. Flower-scape from 6ft. to 12ft. long, branched, twining, many-flowered; flowers 3in. across; upper sepal reniform, 1½in. broad, wavy and crisped; lower sepals 2in. long by ½in. wide, curved, crisped, and wavy; petals oblong, over 1in. long, wavy, curled in till they almost meet over the column; lip small, fleshy, hastate, with a crest of five prominent ridges. The colour of the whole flower is bright cinnamon-brown, with the upper half of the petals and the edges of the sepals yellow. This species blossoms in winter. It should be planted in a roomy, well-drained pot, in a mixture of turfy peat and sphagnum, and be grown in the cool-house. Peru, 1850. (Fig. 138; B. M., t. 5632.)

O. splendidum (*A. Rich.*).—One of the finest of cultivated Oncidiums. Its flowers resemble those of *O. tigrinum*—indeed, Sir Joseph Hooker called it a variety of that plant. Until 1888, *O. splendidum* was scarcely known in gardens, but it has since been introduced in great quantities. It has roundish, compressed, one-leaved pseudo-bulbs, about 2in. in diameter. Leaf leathery, thick, oblong-ovate, 6in. to 12in. long, 2½in. broad, dull green. Flower-spike erect, branched, 2ft. or more in length, and many-flowered; flowers 3in. across; sepals and petals equal, lanceolate, 1in. long, recurved, yellow-green, with broad bands of brown; lip large, narrow at the base, where there are two small lateral lobes, the blade being 2in. broad and 1½in. long colour a rich, uniform yellow, with a white, two-ridged disk. The plant is not by any means easy to cultivate; it is best suited when grown in baskets, in a mixture of peat and sphagnum, and likes plenty of water and sunlight. It does best in the warm intermediate-

Oncidium.

house, and blossoms in spring. Guatemala and Mexico, 1870. (B. M., t. 5878, as *O. tigrinum splendidum.*)

O. superbiens (*Rchb. f.*).—Similar to *O. serratum.* Pseudo-bulbs 4in. long, ovate, compressed, wrinkled when old. Leaves 1ft. long, 1½in. broad, leathery, acute-pointed, and keeled. Flower-spike twining, 2ft. to 5ft. long, branched, many-flowered; flowers 2½in. across; sepals stalked, broad, crisped and wavy, reddish-brown, margined with yellow; petals also stalked, shorter than the sepals, recurved, very wavy, bright yellow, with bands of reddish-brown on the lower half; lip small, purple, lanceolate, recurved, the crest consisting of one large, blunt, lobed, yellow tooth. This is an attractive plant when in flower, but, like all the plants belonging to the group with large sepals and petals and a very small lip, it is not easy to flower, although it grows freely and keeps in robust health in a cool house under ordinary treatment. Like its allies, it requires a liberal allowance of root-room and plenty of water at all times. Colombia, 1871. (B. M., t. 5980.)

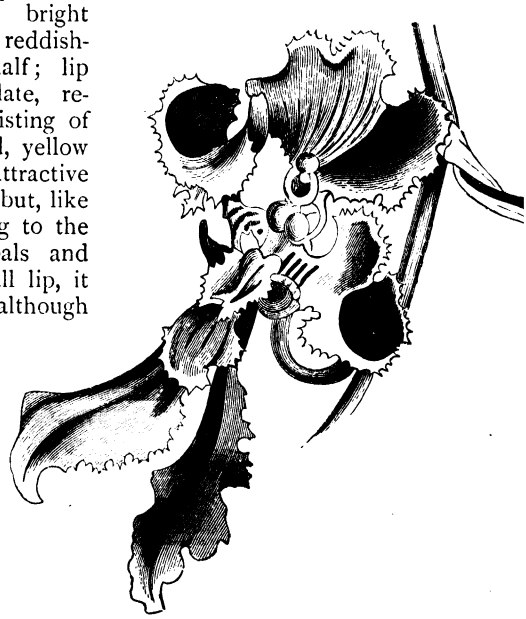


FIG. 138. FLOWER OF ONCIDIUM SERRATUM (nat. size).

O. tigrinum (*Llav. and Lex.*).—A most beautiful free-flowering, violet-scented species, that thrives under ordinary treatment. It has large, broadly ovate, compressed pseudo-bulbs, 3in. long, and two-leaved. Leaves stout, leathery, bright green, about 1ft. long by 2in. broad. Flower-spike stout, erect, 3ft. long, branched, many-flowered, each flower on a pedicel 1½in. long, and measuring 2½in. across; sepals and petals equal, 1in. long, wavy, recurved, acute-pointed, rich reddish-brown, with a few

Oncidium.

bars and blotches of dull yellow; lip narrow and eared at the base, then expanded into a broad reniform or almost orbicular blade nearly 2in. across, its colour being bright sulphur-yellow. No plant could be more useful than this, its blossoms usually developing in late autumn and winter, lasting several weeks, and



FIG. 139. FLOWERS OF ONCIDIUM VARICOSUM ROGERSII (nat. size).

filling the house with a delightful fragrance. It thrives in a warm greenhouse, requiring, in other respects, the same treatment as the Odontoglossums. Mexico, 1840. (R., ii., t. 88.)

O. varicosum (*Lindl.*).—One of the most elegant and attractive-flowered Orchids. It has ovate, angled, furrowed pseudobulbs 2in. to 4in. high, each bearing two strap-shaped, firm,

Oncidium.

dark green leaves about 9in. long. Flower-spikes strong, arching, many-branched, sometimes 3ft. long, and heavily laden with flowers, which are about 1in. across; sepals and petals small, green, with brownish blotches; lip large, spreading, bright yellow, with two ovate lateral lobes, then a narrow and short waist; the large middle lobe being kidney-shaped and notched; crest fleshy and curiously toothed. Cultivated on blocks or rafts, or in baskets, in a mixture of peat-fibre and sphagnum, and kept in the moist end of the Cattleya- or the intermediate-house whilst

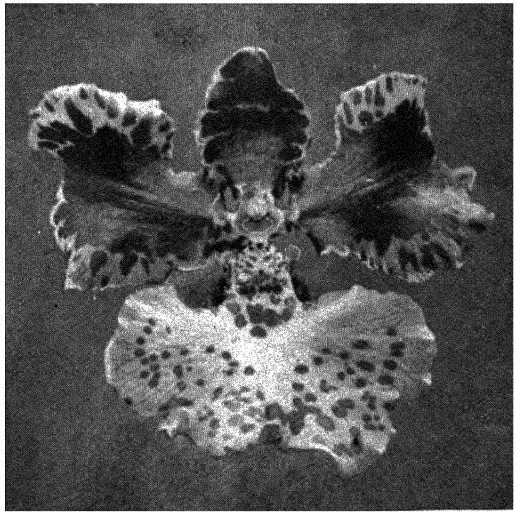


FIG. 140. FLOWER OF ONCIDIUM MARSHALLIANO-FORBESII (nat. size).

growing, this and the following will produce fine spikes of flower during winter and spring. Whilst in bloom they may be transferred to the cool-house. Brazil, 1847. (W. O. A., iv., t. 192.)

Var. *Rogersii* is by far the best of the several known to cultivation. Specimens with spikes bearing over 150 flowers have been grown in England. The lip in this variety is fully 2in. across, and is of a rich golden-yellow colour, with a few bars of red at the base. (Fig. 139; Fl. Mag., t. 477.)

O. zebrinum (*Rchb. f.*).—Belonging to the small-lipped section is this very beautiful, large-flowered species. In habit, pseudo-bulb,

Oncidium.

and foliage, the plant is identical with *O. macranthum.* Flower-spike twining, 6ft. to 12ft. long, branched, and many-flowered; flowers over 2in. across; sepals and petals almost similar, 1¼in. long, narrowed to a stalk at the base, ½in. broad in the middle, the point acute, and the margins very wavy, colour white, with bands of reddish-purple across the lower half; lip small, bent almost at right angles, fleshy, the crest thick, toothed, and warty, colour yellow, with spots of red. Venezuela, 1871. It requires the same treatment as *O. macranthum*, and flowers in August, remaining in beauty for about a month. (B. M., t. 6138.)

NATURAL HYBRIDS.

caloglossum	Syn. *O. Marshalliano-Forbesii.*
elegantissimum	Syn. *Gardneri.*
flabelliferum	Syn. *Gardneri.*
Gardneri	*Gardneri-Forbesii* and *dasystyle.*
Larkinianum	Syn. *Marshalliano-Forbesii.*
Mantinii	Syn. *Marshalliano-Forbesii.*
Marshalliano-Forbesii (Fig. 140)	*Marshallianum* and *Forbesii.*
pictorale	Syn. *Marshalliano-Forbesii.*
Pollettianum	Syn *Gardeneri.*
præstans	Syn. *Gardneri.*
prætextum	Syn. *Gardneri.*
Wheatleyanum	*crispum* and *dasystyle.*

OPHRYS and ORCHIS.

These genera are dealt with in the section on Hardy Orchids at the end of the work.

ORNITHIDIUM.

About a score of botanically interesting epiphytal Orchids, belonging to the tribe *Vandeæ*, are included in the above-named genus. The name, given by Salisbury, is from *ornis*, *ornithos*, a bird, and *eidos*, like: the upper lip of the stigma is beak-like. The species are natives of tropical America, from Brazil to the West Indies. Flowers mediocre, or rather small; sepals sub-equal, free, spreading; petals similar to the sepals, or somewhat smaller; lip affixed to the foot of the column, unguiculate at base; peduncles one-flowered, fasciculate in the axils; leaves oblong or elongated, thinly coriaceous. Stems in some species ascending, and in others root-like and branching; sheathed with imbricated scales, and bearing one-leaved pseudo-bulbs. Probably the only species in general

Ornithidium.

cultivation is the orange-scarlet-flowered *O. Sophronitis* (*Rchb. f.*). This may be grown successfully in a cool intermediate-house temperature, if treated as advised for *Sophronitis grandiflora.*

ORNITHOCEPHALUS.

Sir Joseph Hooker founded this genus of warm, intermediate-house, epiphytal Orchids, belonging to the tribe *Vandeæ*. The name is derived from *ornis*, *ornithos*, a bird, and *kephale*, a head, and is in reference to the form of the column and anther. The species are natives of tropical America, the only one probably in cultivation being *O. grandiflorus* (*Lindl.*). Flowers yellow; inflorescence many-flowered. Leaves large, oblong, blunt, acute or obtuse. It is best suited by being grown in a basket, where it can be suspended in a moist position. The compost consists of two parts chopped sphagnum to one of peat-fibre. Free drainage must also be afforded. It requires a liberal amount of water during the active season of growth, while in a dormant state only sufficient to keep the foliage in a plump condition is necessary.

ORNITHOCHILUS.

This small genus of stove or East Indian-house epiphytal Orchids belongs to the tribe *Vandeæ*. The species are natives of Burma and the Himalayas. The name given by Wallich is from *ornis*, *ornithos*, a bird, and *cheilos*, a lip; and is in allusion to the shape of the labellum. Flowers small, pedicellate, disposed in lateral racemes; sepals spreading, the lateral ones rather broader; petals rather narrower than the dorsal sepal; lip spreading at the base of the column; lamina two- or three-lobed. The species are rarely found in cultivation outside botanic collections. They require the same cultural conditions as *Aërides.*

OTOCHILUS.

Three or four species of stove or East Indian-house Orchids of the tribe *Epidendreæ*, natives of the Himalayas and Burma, are found under the above-named genus. Lindley's name is from *ous*, *otos*, an ear, and *cheilos*, a lip,

Otochilus.

and is in reference to the ear-like appendages at the base of the lip. Flowers loosely racemose; sepals and petals almost equal, free, narrow, spreading; lip sessile at base of column, saccate at base. The species belonging to this genus are rarely seen outside botanic gardens.

PACHYSTOMA.

As understood by Kew, this genus of terrestrial Orchids, belonging to the tribe *Epidendreæ*, does not include *Ipsea*—a plan that has been followed in this work. Blume's name is from *pachys*, thick, and *stoma*, a mouth, in allusion to the thick lip. The species are natives of tropical Africa, the East Indies, and the Malayan Archipelago. Flowers mediocre, or rather large, pendulous, in a simple raceme; sepals connivent, the lateral one sometimes very shortly adnate to the base of the column; petals similar to the lower sepal, but smaller; lip affixed to, or adnate to, the base of the column, the lateral lobes oblong and erect, the middle one short. Probably the only species in cultivation is *P. Thomsoniana* (*Rchb. f.*). This is rarely met with outside botanic collections. The cultural requirements are the same as those recommended for the small-growing section of *Cœlogyne*, better known in gardens as *Pleione*.

P. Fortunei (*Rchb. f.*).—A synonym of *Spathoglottis Fortunei*.

P. speciosum (*Rchb. f.*).—A synonym of *Ipsea speciosa*.

PALUMBINA (*Rchb. f.*). This is now merged with **Oncidium.**

PAPHINIA (*Lindl.*). This is now included under **Lycaste.**

PARADISANTHUS.

Reichenbach's (*fils*) name for a small genus of Orchids belonging to the tribe *Vandeæ*. It is derived from *Paradeisos*, park, Paradise, and *anthos*, a flower, and is in reference to the beauty of the plant. Flowers white, curiously striped with deep purple; sepals oblong-lanceolate, acute, the two lateral ones slightly unequal at the base; lip shortly clawed, often pendulous; pollen-masses four,

Paradisanthus.

depressed, pyriform. Leaves lanceolate, acute, green, subglaucous, twin. These plants, which are rarely seen in cultivation, are best grown suspended from the roof, in the temperature of an intermediate-house. *P. bahiensis* (*Rchb. f.*) is the species oftenest grown.

PELEXIA.

Interesting, but not very ornamental, warm-house terrestrial Orchids, belonging to the tribe *Neottieæ*. The name given by Richard is derived from *pelex*, a helmet, and is in reference to the shape of the back sepal. Flowers mediocre, arranged in a sometimes dense, sometimes elongated and loose, sub-sessile spike; back sepals erect, connate with the petals in a narrow galea; lateral ones linear; lip affixed to the base of the peltate column, erect, linear, canaliculate, the base produced into a spur-like lamina; column short. Leaves either radical and long-stalked, or few and many-sheathed at the base of a simple stem. The species, which are rarely found in cultivation, require the same cultural requirements as *Anœctochilus*.

PERISTERIA.

Sir Joseph Hooker is responsible for the name of this small genus of tropical American Orchids, belonging to the tribe *Vandeæ*. It is derived from *peristera*, a dove, and has reference to the dove-like appearance of the column. Six or eight species have been discovered. They are handsome in appearance, and are characterised by large, fleshy pseudo-bulbs, surmounted by several long, plicate, pointed leaves. The flowers are produced on erect or drooping scapes that spring from the base of the pseudo-bulbs. They are fleshy, fragrant, and nearly spherical. The sepals are concave, and united at the base, and the petals resemble them, except that they are a little smaller. The lip is continuous with the column, and is sagittate at the base, the upper half being bent over the face of the column, which is short and fleshy. *P. elata* is the finest species, and on account of its beauty and remarkable structure, has given rise to both the generic and popular names—Dove Orchids.

Peristeria.

Culture.—The successful culture of Peristerias depends principally on their having very liberal treatment whilst growing, and a well-defined period of rest afterwards. When signs of growth appear, the plants should be potted in a well-drained compost of fibrous loam, crock-dust, and leaf-mould, and placed in a moist, stove-house. Water carefully at first, increasing the supply as the new growths gain strength. When the pots are full of roots, an occasional dose of weak liquid manure is to be recommended. During rest they may be removed to the cooler part of the Cattleya-house, very little water being then needed. *P. elata* is very successfully grown by some cultivators, who treat it as a purely terrestrial Orchid, potting it in a mixture of loam and leaf-mould, with a sprinkling of crushed bones and silver-sand added. The pots may be plunged in a tan bed in a moist, sunny stove during the growing season. When growth is complete, the plants may be removed to an intermediate-house, and given less water; they should not, however, be allowed to shrivel. Bulbs as large as swans' eggs, and flower-spikes 5ft. high, have been produced by this treatment. Peristerias are easy to keep alive, but unless they get very liberal treatment they will not flower.

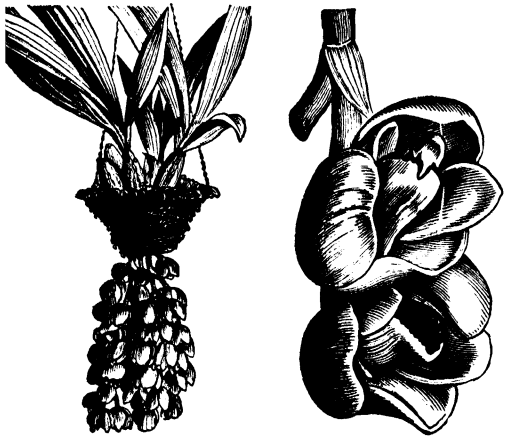


FIG. 141. PERISTERIA CERINA, SHOWING HABIT AND DETACHED FLOWERS

(Habit, much reduced; Flowers, nat. size).

P. Barkeri (*Batem.*).—A synonym of *Acineta Barkeri*.

P. cerina (*Lindl.*).—A handsome species, having large flowers in pendent spikes, and with a strong smell like that of bruised juniper-leaves. The pseudo-bulbs are egg-shaped, furrowed, dark

Peristeria.

green, and 3in. long. Leaves 1ft. or more long, lanceolate, stout, plaited, and dark green. Flower-spike short, stout, always pendulous, as shown in Fig. 143, and bearing from six to a dozen flowers, which are fleshy, somewhat cupped, and coloured yellow, sometimes with the addition of a sprinkling of small, purple dots. A variety called *guttulata* is thickly dotted with violet. A plant such as is represented in the illustration is both singular in appearance and ornamental.

During summer this species should be grown in the Cattleya-house. It blossoms in June. Mexico, 1837. (Fig. 141; B. R., t. 1953.)

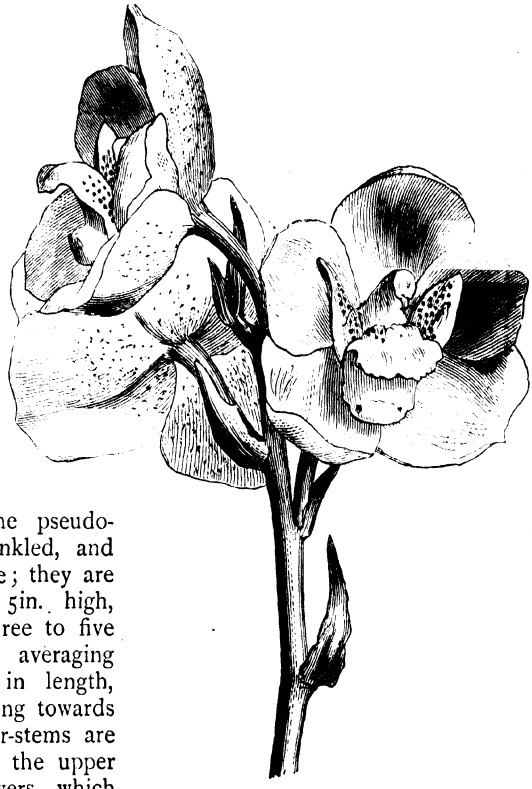


FIG. 142. FLOWERS OF PERISTERIA ELATA (nat. size).

P. elata (*Hook.*).—When well grown this stately species is in every way a very ornamental plant. The pseudo-bulbs are slightly wrinkled, and broadly ovate in outline; they are usually from 4in. to 5in. high, and bear at the top three to five strong-nerved leaves, averaging between 2ft. and 3ft. in length, by 6in. in width, tapering towards both ends. The flower-stems are erect, 3ft. to 5ft. high, the upper third bearing the flowers, which are sweetly scented, wax-like, somewhat cupped, and measure 2in. across. The sepals are concave, and, like the smaller and more delicate petals, are shining white. The most remarkable feature of the flower is the column, which is united to the base of the thick and fleshy lip, and is furnished with two white, spreading, fleshy wings, and a bird's-head-like-top, supposed to bear a resemblance to a dove. The lip and wings are sometimes

Peristeria.

spotted with purple. This species flowers from June to September the racemes continuing to develop flowers for six or seven weeks after opening. It was introduced in 1826 from Panama, where, because of the resemblance alluded to, it is called by the Spaniards El Spirito Santo. (Fig. 142; B. M., t. 3116.)

P. Humboldtii (*Lindl.*).—A synonym of *Acineta Humboldtii.*

P. pendula (*Lindl.*).—A distinct and handsome species, with oblong, furrowed pseudo-bulbs, and lance-shaped, striated leaves. The flower-scape is pendulous, from 1ft. to 1½ft. long, and is produced from the base of the pseudo-bulb. As many as twenty flowers have been produced on a single raceme. They are fragrant, and nearly globular, measuring 1in. to 1½in. across. The sepals are concave, and united at the base, and, together with the smaller petals, are of a pale yellow, tinged with rose, and thickly dotted with purple, on the inner side. The thick, fleshy lip is yellowish-white, with small, purple spots, and has an elevated protuberance on the centre. The column is furnished with two wings passing downward into the lip. *P. pendula* rarely flowers in cultivation: the finest example of it ever seen in England was grown in the collection of Baron Schrœder. The species requires tropical treatment, and should be planted in a teak basket. British Guiana, 1836. (B. M., t. 3479.)

PESCATOREA (*Rchb. f.*). This is now included under **Zygopetalum.**

PHAIO-CALANTHE.

Bigeneric hybrids, produced by the intercrossing of *Calanthe* and *Phaius.* The cultural requirements are similar to those recommended for *Phaius.*

Arnoldiæ *P. grandifolius* and *C. vestita Regnieri* (Sander).
Berryana *P. Humblotii* and *C. Masuca* (Sander).
Brandtæ *P. Wallichii* and *C. Veitchii* (Sander).
grandis *P. grandifolius* and *C. Bryan* (Cookson).
inquilinus *P. vestitus* and *C. Masuca.*
This hybrid was described by Reichenbach as a Phaius, but should no doubt be classed among the Calanthes.
inspirata *P. grandifolius* and *C. Masuca* (Veitch).
irroratus *P. grandifolius* and *C. Veitchii* (Veitch).
Niobe *P. grandifolius* and *C. gigas* (Veitch).
Ruby *P. Sanderianus* and *C. Oakwood Ruby* (Cookson).
Schrœderiana *C. Baron Schrœder* and *P. Wallichii* (Veitch).
Sedeniana *P. grandifolius* and *C. Veitchii* (Veitch).

PHAIUS.

A useful genus of terrestrial Orchids founded by Loureiro, the name being derived from *phaios*, shining, in allusion to the flowers. Most of the species are easily-grown, free-flowering, and of stately and ornamental habit. They have long, lance-shaped, plaited leaves, and erect flower-scapes bearing generally large and showy flowers. The sepals and petals are large and spreading; the lip is erect, and stands out from the rest of the flower, the base forming a kind of chin or spur, and the sides folding over and inclosing the long and slender column; the front portion is usually expanded, and has a wavy margin. *Thunia* is sometimes included under this genus, but the species being quite distinct in habit and inflorescence, we prefer to accord it generic rank. *Phaius* has a wider distribution than most genera of Orchids, occurring abundantly throughout tropical Asia, and also in tropical Africa, Madagascar, and Australia.

Culture.—The species described, with the exception of the rare *P. simulans* are easy to grow and flower. They flourish in a compost of fibrous loam, leaf-soil, chopped sphagnum, and silver-sand, to which may be added, for the potting of well-rooted specimens, a small proportion of dried cow-dung. During the active season they like a warm, moist atmosphere, and liberal waterings at the root. Occasional applications of manure-water add colour and vigour to the growth after the pots have become filled with roots. In summer, or the growing season, the intermediate-house is suitable; but in order to ripen the growth, and cause the plants to flower, they should be subjected to cooler treatment after the leaves have reached their full size. They will then require very little water. *P. grandifolius* and *P. Wallichii* often produce a large number of young growths in spring, and unless required for propagation, these should be thinned out in proportion to the size of the pot. By this means, stouter flower-scapes and larger and more numerous flowers are obtained. The hybrids that Mr. Norman Cookson has been so successful in raising from *P. simulans* (*Rolfe*) and *P. Humblotii* as one of the parents, are among the most useful and beautiful Orchids that can be desired for decorative purposes. They may be used in either the conservatory

Phaius.

or the drawing-room while in bloom, and as they are in beauty at a time when flowering plants are most appreciated, they cannot be too highly recommended.

P. albus (*Lindl.*).—A synonym of *Thunia alba.*

P. Bensonæ (*Benth.*).—A synonym of *Thunia Bensonæ.*

P. Bernaysii (*F. Muell.*).—A variety of *P. Blumei.*

P. bicolor (*Lindl.*).—An easily-grown, useful, and ornamental species, closely resembling *P. grandifolius* in habit, the leaves only being somewhat narrower, and of firmer texture. The flowers measure over 4in. across, and are produced on strong, erect spikes, sometimes 5ft. in height. The pointed sepals and petals are 2in. or more long, and of a bright reddish-brown; the side lobes of the lip are rose-coloured, and folded over the column, the broad front lobe being yellowish-white, flushed with rose. The flowers are developed in summer. Ceylon, 1837. (B. M., t. 4078.)



FIG. 143. FLOWER OF PHAIUS HUMBLOTII (nat. size).

P. Blumei (*Lindl.*).—A desirable species with lance-shaped, plaited leaves, 2ft. in length, and short, roundish pseudo-bulbs, produced from a creeping rhizome. The flowers are individually about 4in. in diameter, and are borne on the upper half of flower-scapes that originate at the base of the pseudo-bulbs, and attain a height of 3ft. to 4ft. The sepals and petals are lance-shaped, pointed, and of an olive-brown colour. The sides of the lip are yellowish, and fold over the column, the large, expanded front lobe narrowing to a point at the apex, and being of a pretty crimson, edged with yellow. This species flowers in March and April, and is a native of Java.

Var. *Bernaysii* (*Rchb. f.*) has the sepals and petals white on the outside, yellow within; the side lobes of the lip are

Phaius.

sulphur-yellow, and the middle lobe is white, with a yellow centre. Queensland, 1873. (B. M., t. 6032, as *P. Bernaysii.*)

P. Brymerianus (*Hort.*).—A synonym of *Thunia Brymeriana*.

P. grandifolius (*Lour.*).—An old garden favourite, and still one of the most frequently cultivated. Its ornamental appearance, together with its easy culture, renders it a most valuable Orchid. It has large, roundish pseudo-bulbs, and large, dark green, plaited leaves, from the base of which the spikes of flowers are produced. These are 3ft. to 4ft. high, and bear numerous showy flowers, about 4in. in diameter. The oblong, pointed sepals and petals are white on the outside, and of a reddish-brown within. The projecting lip is tubular, 1½in. long, spreading at the apex, white, the throat and disk being yellow, and the sides flushed with crimson. This species is a native of China and Australia, and was introduced to cultivation in 1778. It is now cultivated in most tropical countries, and in some parts has become naturalised. It flowers at various times between December and June, most frequently in March and April. (B. M., t. 1924.)



FIG. 144. FLOWERS OF PHAIUS HUMBLOTII ALBIFLORA

(much reduced).

P. Humblotii (*Rchb. f.*).—Flowers rosy, with white and red blotches, large; lip spurless, having a saddle-like callus on its disk, running out in a small keel; raceme many-flowered. One of the most beautiful species in cultivation. It should be grown

Phaius.

in an intermediate-house temperature, when it will flower in summer. Madagascar, 1880. (Fig. 143, for which we are indebted to the Editor of "The Gardeners' Chronicle.")

Var. *albiflora*.—A most distinct and beautiful variety; the sepals and petals pure white, the lip deep purple, instead of brown, as in the type. (Fig. 144.)

P. maculatus (*Lindl.*).—One of the few Orchids having variegated foliage; its flowers are also very beautiful. The pseudo-bulbs are 2in. high, furrowed, and ovate. The plaited leaves are 1½ft. to 2ft. long, by about 4in. wide, tapering at each end; they are dark green, freely marked with large, roundish, yellow spots. The flower-stems are 1½ft. to 2ft. high, and towards the top bear ten to fifteen flowers, rather closely arranged. The flowers are 2in. to 3in. across, with the oblong sepals and petals of a clear, soft yellow, and the cylindrical lip also yellow, but streaked with reddish-brown on the edges of the middle lobe. This species is a native of Northern India and Japan, and succeeds well in an intermediate-house. It was introduced in 1823. Syn. *Bletia Woodfordii*. (B. M., tt. 2719 and 3960.)

P. Marshalliana (*Nichols.*).—A synonym of *Thunia Marshalliæ*.

P. Sanderianus (*Hort.*).—A synonym of *P. Mannii Wallichii*.

P. simulans (*Rolfe*).—This species is very nearly allied to *P. tuberculosus*, and has been cultivated in gardens for it until quite recently, but the growth is more bulbous in the true species. Its small, slender pseudo-bulbs spring from a rhizome-like stem that emits roots freely. The leaves are from 6in. to 9in. long. The flowers are borne on erect spikes, and are each 2½in. in diameter, with pure white sepals and petals, the latter overlapping the slightly narrower sepals. The beautiful lip is three-lobed; the lateral lobes are yellow, almost covered with dull brownish-crimson spots, and arched over the slender, curved column; the central lobe is smaller and roundish, divided at the apex, wavy, and white, spotted with rosy-purple. A native of Madagascar, whence it was introduced in 1880. As before intimated, this species is a difficult plant to grow successfully. It requires a higher temperature than the other species, and should have a shady, moist position in the tropical house. It thrives when fastened to an upright raft, with a tuft of living sphagnum about its rhizomes. (Fig. 145.)

P. tuberculosus (*Blume*).—Rhizomes tufted, ovoid, and ringed. Side lobes of the lip without hairs, the three deep yellow keels 2½ lines long being somewhat verrucose, high and truncate in front, and thus club-shaped, the middle one

Phaius.

channelled; disk behind the keels purple, with the nerves only slightly thickened, and bearing near the base numerous white hairs, arranged in four rows, the outer pair much smaller than the inner pair. Base of column bearing V-shaped yellow marking. Syn. *P. Warpurii.* (O. R., vol. ix., p. 41, fig. 7.)

P. Wallichii (*Lindl.*).—In habit this fine species is similar to *P. grandifolius.* Its leaves are from 3ft. to 4ft. long, with prominent, longitudinal nerves, and its flower-stems are erect, and from 3ft. to 5ft. in height. The flowers are 4in. across, with



FIG. 145. FLOWERS OF PHAIUS SIMULANS
(nat. size).

lance-shaped sepals and petals, white on the outside, and of an orange-yellow, flushed with reddish-purple, on the inner side. The lip is yellow, except in the throat, where it is of a brownish-purple; it is pointed at the apex, and has a crisped margin. A native of the Khasya Hills, whence it was introduced in 1837. It is well suited for room decoration, its stately habit being very effective, and its flowers lasting about six weeks. It blossoms from February to May.

Phaius.

Var. *Manni* has larger flowers, much deeper in colour, and is one of the handsomest members of the genus. Syn. *P. Sanderianus*. (B. M., t. 7023, as *P. Wallichii*.)

P. Warpurii (*Rolfe*).—A synonym of *P. tuberculosus*.

GARDEN HYBRIDS.

amabilis *grandifolius* and *simulans* (Sander).
Ashworthianus *Wallichii Mannii* and *maculatus* (Sander).



FIG. 146. FLOWER-SPIKE OF PHAIUS NORMAN

(much reduced).

Cooksonæ *grandifolius* and *Humblotii* (Cookson).
Cooksoni *Wallichii* and *simulans* (Cookson).
D. S. Brown *amabilis* and *grandifolius* (Sander).
Gravesii *Wallichii* and *grandifolius* (Graves).
hybridus *grandifolius* and *Wallichii* (Drewett).
Joicyanus..... *Blumei* and *amabilis* (Sander).
maculato-grandifolius *grandifolius* aud *maculatus* (Veitch).

Phaius.

Marthæ	*Blumei* and *simulans* (Sander).
Norman (Fig. 146)	*Wallichii Mannii* and *simulans* (Cookson).
oakwoodiense	*Cooksoni* and *Humblotii* (Cookson).
Owenianus	*bicolor* and *Humblotii* (Sander).
Phœbe	*Wallichii* and *Humblotii* (Cookson).
Ruby.....	*Cooksonæ* and *Humblotii* (Cookson).

PHALÆNOPSIS.

For magnificence of flowers no genus of tropical Orchids surpasses *Phalænopsis* (*Blume*); indeed, it may be said to comprise some of the most beautiful of the whole Natural Order. The generic name is from *phalaina*, a moth, and *opsis*, resembling—hence the popular name of Moth Orchid. The species are mostly natives of the hottest and moistest parts of the Old World, their natural range extending from Assam and Burma, through the Islands of the Indian Archipelago, to the Moluccas and the Philippines. Although the first *Phalænopsis* was discovered in the Island of Amboyna as early as 1750, and figured about the same date, it was not until 1836 that a living plant was introduced to this country. This flowered in 1838, and proved to be *P. amabilis*. There are now many species in cultivation, all of which are epiphytes and, with the exception of *P. Lowii*, evergreen. The leaves usually number from four to eight, and are closely arranged in two opposite rows. None of the species have pseudo-bulbs, but the leaves are generally thick and leathery; in several the upper surface is prettily mottled with silvery-grey, and the underside coloured deep purple. The genus is distinguished by the grace with which the flowers are displayed; they usually face in one direction, and are elegantly supported on slender, frequently branching racemes. Another charm of *Phalænopsis* is their remarkably free-flowering nature; *P. Schilleriana* has been known to bear over 170 flowers on a raceme, and as each flower is 2in. across, very full and spreading, its striking appearance may be easily conceived.

In regard to the individual flower, the genus may be roughly divided into two sections: the one in which the sepals and petals are about the same size, and the lip is undivided at the apex—represented by *P. Luddemanniana*

and *P. violacea*—and the other in which the petals are much larger and broader than the sepals, and where the apex of the lip separates into two divergent horns, which in some species assume quite a thread-like form. To the latter section the showiest species belong. A valuable property is the length of time the flowers remain in beauty; indeed, in cases where the plants are not in the most vigorous state, it is advisable to remove the flowers before they naturally fade.

Culture.—Although in some instances, where particular requirements appear to be exactly met, Phalænopses grow as freely as Cypripediums do, such is not by any means always the case. It often happens that, through differences in moisture, ventilation, &c., they succeed in the same house much more satisfactorily in one part than they do in another. In one particular instance of our own experience, every endeavour had been made to grow the plants successfully for many years, but the results were most unfavourable. It was decided that they should be removed to another house. In doing so, it was found that two or three of the plants had no apparent life, excepting in the roots around the base of the crown, and because of their unsightliness they were hung from the roof of the old house, little hopes being entertained of their recovery. They had not been in this position long, before they commenced breaking, and continued to grow in a satisfactory manner. In a few months the whole of the plants were returned to their old house and suspended like the previously discarded plants, and although only a few inches nearer the glass than the original position on the stage, the whole of them made such good progress that it is doubtful if a finer lot of Phalænopses are to be found in cultivation. It is also worthy of note that the majority of these plants had been in cultivation for over twenty years.

Phalænopses are best accommodated when grown in baskets. Afford plenty of drainage, and let the potting compost consist wholly of chopped sphagnum. During the growing season an abundant supply of water must be afforded, and the plants must not be allowed to suffer from want of moisture until the flowering period is over. From the flowering season until the return of May, when the plants commence to root, little water is required.

Phalænopsis.

P. amabilis and *P. Stuartiana* are the best species for an amateur to commence with: they are probably the easiest to grow, and are fully as beautiful as any others. In spring, about April or May, the plants should be examined at the root, and all dead and decaying matter brushed or washed away. This may be done without disturbing the living roots that cling to the teak and cannot be removed without risk. We have often taken away all the drainage and sphagnum, washed the roots and inside of the baskets or pans, and replaced the drainage and moss, without loosening a single live root. Should the plants require a shift into larger receptacles, the roots must be carefully removed by drawing a thin knife between them and the teak bars. It is a difficult operation and requires considerable patience, or the roots will be injured if not quite destroyed. Messrs. Hugh Low and Co., of the Bush Hill, Nurseries, Enfield, have long been famous for their success in importing and cultivating Phalænopses. The more popular species are represented in their nurseries by the thousand, and when in blossom they form a picture of the greatest beauty.

P. amabilis (*Lindl.*).—A synonym of *P. Aphrodite.*

P. amabilis (*Blume*).—Probably the finest species as regards the size and purity of its flowers, and certainly one of the loveliest Orchids in cultivation. Its light green, oblong leaves are very thick and leathery, healthy plants being ornamental even when not in blossom. Its strikingly beautiful flowers are from 4in. to 5in. in diameter, and are produced on stout, long, arching, purplish-coloured racemes. The petals are much broader than the sepals, which they overlap, both being pure white. The three-lobed lip is chiefly white, the front margins of the side lobes having a yellowish tinge; the middle lobe is pear-shaped, the extremity separating into two yellow filaments, which curve upwards. It was introduced in 1846 from Java and Borneo, where it is found attached by its roots to the trunks of trees. It flowers at all seasons of the year, generally from March to October. Syn. *P. grandiflora* (*Lindl.*). (B. M., t. 5184.)

P. antennifera (*Rchb. f.*).—A variety of *P. Esmeralda.*

P. Aphrodite (*Rchb. f.*).—A beautiful, free-flowering species, the flowers, if kept dry, remaining fresh for several weeks. It has thick, elliptical, lance-shaped, brownish-green leaves, divided

Phalœnopsis.

obliquely by a prominent midrib. The flowers are borne in two opposite rows, on long, pendent, often branching racemes; they are 3in. in diameter, and are entirely white except the lip, which, on the inner side, is spotted and streaked with rosy-pink and yellow. In shape the sepals are broadly ovate, the petals being still broader and somewhat rhomboidal; the lip is three-lobed, the side lobes standing erect at each side of the column, and the central one dividing at the apex into two slender, twisted filaments. It is found in Java and the Philippine



FIG. 147. PHALÆNOPSIS (1) APHRODITE, (2) SCHILLERIANA, (3) STUARTIANA (much reduced).

Islands, and was first introduced in 1836. It flowers at various seasons, but most freely during the summer months. Syn. *P. amabilis* (*Lindl.*). (Fig. 147; B. M., t. 4297.)

Var. *gloriosa* (sometimes accorded specific rank) has flowers a trifle larger, and it also differs slightly in the callus on the lip. The varietal name is sufficiently indicative of its beauty.

P. Esmeralda (*Rchb. f.*).—This small, pretty-flowered species has erect flower-spikes. The leaves are thick and fleshy, grey-green, with a few dull brown spots; in strong plants the

Phalœnopsis.

leaves do not exceed 3in. in length. The flower-spike varies in length from 6in. to 1½ft., and bears from six to a dozen or more flowers, each ½in. across; sepals and petals equal in size, and coloured light rosy-purple; lip deep purple, with a pair of yellowish lateral lobes and two slender, narrow appendages near its base. Burma and Cochin China, 1874. (Fig. 148.)

Var. *antennifera* differs from the type only in having flowers a little darker in colour.

P. gloriosa (*Rchb. f.*).—A variety of *P. Aphrodite.*

P. grandiflora (*Lindl.*).—A synonym of *P. amabilis* (*Blume*).

P. Lowii (*Rchb. f.*).—Though small as to flowers, this is a species of extreme elegance and beauty. Its leaves are deep green, tinged with purple, and four or five occur in a tuft on each plant; they are about 4in. long, 1½in. broad, and pointed. The flower-spike is slender, of a purplish tinge, and carries from five to twenty flowers. The latter are 1½in. in diameter, with the oblong sepals and the broader, rounded petals white, flushed with purple. The lip is three-lobed, and of a rich violet-purple, the side lobes being slightly paler than the central one. The apex of the column is pale purple, and in shape may be compared to an elephant's trunk. The flowers expand during the

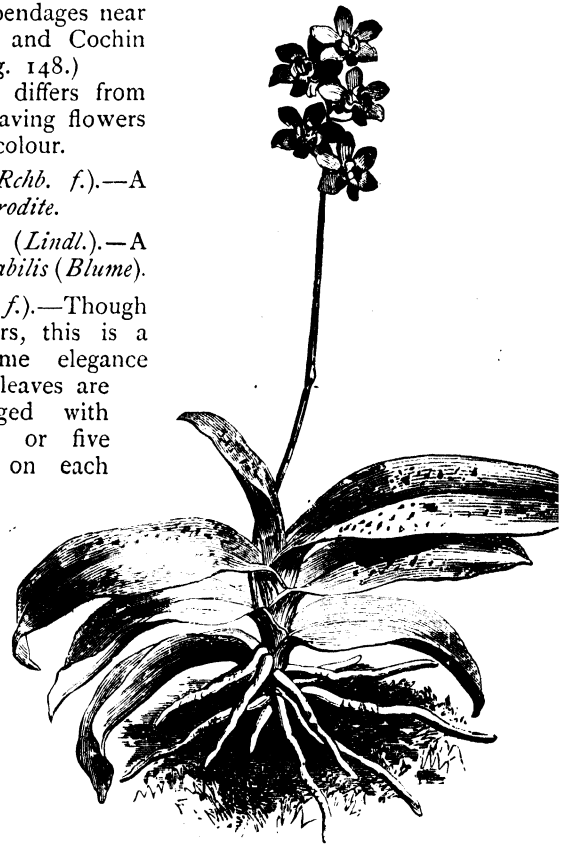


FIG. 148. PHALÆNOPSIS ESMERALDA (½ nat. size).

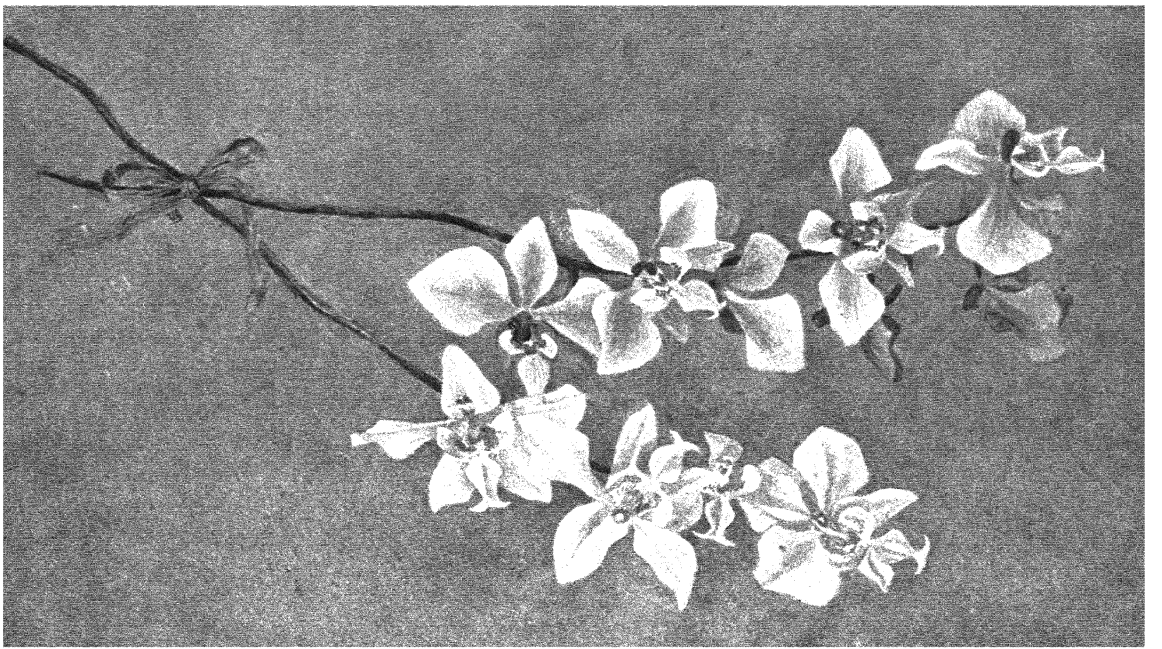
Phalœnopsis.

summer months, and remain for some weeks in beauty. This plant is commonly supposed to cast all its leaves annually, but several specimens have come under our notice that retained their leaves throughout the year. It has been suggested in explanation of this that both deciduous and evergreen forms of the plant exist in a wild state, the variation being due to differences in climatic conditions We have had specimens succeed admirably when grown on rafts of teak, with sphagnum placed about the roots, and suspended in a very moist and shaded position in a stove, the moss being kept damp and growing throughout the year. It is, however, one of the most difficult of all Phalænopses to cultivate. Moulmein, Borneo, &c., 1862 (B. M., t. 5351.)

P. Luddemanniana (*Rchb. f.*).—A compact-growing plant, with thick, oblong leaves 6in. to 8in. in length. On cultivated plants the flower-spike rarely reaches more than 8in. in length, and bears a few handsome flowers towards the apex. The flowers are between 2in. and 3in. wide, the sepals and petals being oblong and pointed, with the ground-colour white, prettily marked with transverse lines of violet-purple towards the base, and of brown towards the points. The middle lobe of the lip is oblong, and of a deep violet colour, the side lobes being narrower and pale purple. On account of its distinctiveness, and the long time its flowers last, this species is well worth growing. It is remarkable for the freedom with which it produces young plants on the old flower-spikes, an exceptional character among Orchids, and one that renders the increase of the species easy. Philippines, 1864. (B. M., t. 5523.)

P. Sanderiana (*Rchb. f.*).—The leaves of this very handsome species are almost elliptical, and in colour nearly resemble those of *P. Schilleriana*. They do not, however, grow to such a length, and are usually of about the same size as those of *P. amabilis*. The flowers are from 3in. to 4in. across. The sepals are broadly ovate and about 1½in. long, the larger petals being unusually broad and full. The colour of sepals and petals is generally a soft rose, sometimes with a purplish tinge. The lip is three-lobed, with the side lobes almost orbicular, white, spotted at the base with purple; the middle lobe is white, tinged in certain places on the margin with yellow, and separates at the apex into two long, slender filaments, which curl upwards. This showy Orchid flowers at various seasons, oftenest perhaps in summer. Philippines, 1882. (W. O. A., v., t. 209.)

P. Schilleriana (*Rchb. f.*).—One of the most desirable of the genus, and in both foliage and flower is an extremely handsome



PHALÆNOPSIS SCHILLERIANA.
P. S. VESTALIS.

Phalænopsis.

Orchid. Its beautiful, oblong leaves are sometimes as much as 1½ft. in length, with the upper surface dark green, profusely and irregularly mottled with greyish-white; on the under side they are purple. The flower-scapes are from 1½ft. to 3ft. long, and branch freely, bearing numerous flowers 2½in. to 3in. in diameter. A single inflorescence is recorded as having carried 174 flowers. The sepals are obovate, and, like the larger and more rounded petals, are light mauve or rose, white at the margins. The side lobes of the lip are similarly coloured, the central one being usually paler, sometimes white, with the extremity dividing into two divergent horns; at the base is a yellow callus, spotted with reddish-brown. The species is variable in colour, but all the forms are exceedingly pretty. The roots form a notable feature of the plant, being flat and rough, and produced in great abundance. It is said to have now become scarce in a wild state, so that in a few years it will probably be a much more valuable Orchid. Philippines, 1858. (Fig. 147; B. M., t. 5530.)

Var. *vestalis* has pure white flowers, excepting the yellow at the base of the lip, on which there are a few brownish-yellow spots. It is a rare plant, the only specimen being in Sir Frederick Wigan's collection, Clare Lawn, East Sheen.

P. speciosa (*Rchb. f.*).—Reichenbach described this as a supposed natural hybrid, but to-day it is regarded as a true species. The flowers are purple, with white markings on the lip and at the base of the petals. Andamans. (W. O. A., t. 158.)

P. Stuartiana (*Rchb. f.*).—A distinct and handsome species that is deservedly becoming more popular every year. It occasionally displays the remarkable and, amongst Orchids, very unusual property of producing young plants on the roots. The leaves are oblong, obliquely notched at the tips, and from 6in. to 12in. in length; when young they are prettily marbled on the upper surface. In some forms the leaves become almost entirely green as they grow older; but in many the mottled surface remains fixed, and adds to the beauty of the plant. The flowers are borne on branching racemes, and are about 2in. across. The petals are rhomboidal, and more than twice the width of the oblong sepals; the lower half of the lateral sepals is of a pale sulphur-yellow, spotted with reddish-brown, the upper half, together with the petals, being pure white. The ground of the lip is white, with the side lobes and the central part of the front lobe freely and irregularly spotted with cinnamon-red. The apex is divided into two curving filaments, which in some forms are so much lengthened as to look like tendrils. It was introduced

from Mindanao in 1881 by Messrs. Low and Co. It flowers during the first three months of the year. (Fig. 147; B. M., t. 6622.)

Var. *nobilis* has larger flowers, with fewer but larger spots on the lip and side sepals.

Var. *punctatissima* has the sepals and petals profusely spotted with purplish-red.

P. tetraspis (*Rchb. f.*).—This species approaches *P. violacea*. It bears a rich panicle of white flowers. Lateral lobes of the lip ligulate, retuse, with a tooth at the upper end and a conical callus in the middle; between the lobes are two pairs of bristle-like processes; front lobe of lip rhomboid-ligulate, with a cushion of hairs at the apex. Andamans, 1881. (B. M., t. 7321.)

P. violacea (*Teysm.*).—This has pretty, sweet-scented flowers of distinct colour. Its leaves are tongue-shaped, 8in. to 12in. in length, and of a light shining green. The inflorescence is short, and does not develop more than two or three flowers at once. These are 2in. to 2½in. in diameter, with the broadly lance-shaped sepals and petals of a violet-rose towards the base, changing at the apex to a yellowish tint. The lip is of a rich purplish-rose, the callus being yellow. This species flowers from May to October, lasting a long time in perfection. Malayan Archipelago, 1859. (W. O. A., t. 182.)

Var. *Bowringiana* has light yellow flowers, striped and spotted with purple.

Var. *Schrœderiana* has the sepals and petals white, tinged with rose-purple at the base.

GARDEN HYBRIDS.

Amphitrite	*Sanderiana* and *Stuartiana* (Sander).
Ariadne	*Stuartiana* and *Aphrodite* (Veitch).
Artemis	*amabilis* and *rosea* (Veitch).
Cassandra	*rosea* and *Stuartiana* (Veitch).
F. L. Ames	*amabilis* and *intermedia* (Veitch).
Harrietæ	*amabilis* and *violacea* (Veitch).
Hebe	*Sanderiana* and *rosea* (Veitch).
Hermione	*Stuartiana* and *Luddemanniana* (Veitch).
intermedia	*Aphrodite* and *rosea* (Veitch).
John Seden	*amabilis* and *Luddemanniana* (Veitch).
Lady Rothschild	*intermedia Porteii* and *Sanderiana* (Low).
Leda	*Stuartiana* and *amabilis*.
Ludde-violacea	*violaceum* and *Luddemanniana* (Veitch).
Mrs. J. H. Veitch	*Luddemanniana* and *Sanderiana* (Veitch).
Rothschildianum	*Schilleriana* and *amabilis* (Veitch).
Schilleriano-Stuartiana	*Schilleriana* and *Stuartiana* (Low).
Schrœderæ	*leucorrhoda* and *intermedia Porteii* (Low).
Stuartiano-Mannii	*Stuartiana* and *Mannii* (Veitch).

Phalœnopsis.

Vesta *Aphrodite* and *rosea leucaspis* (Veitch).
Wiganiæ *Schilleriana* and *Stuartiana* (Low).

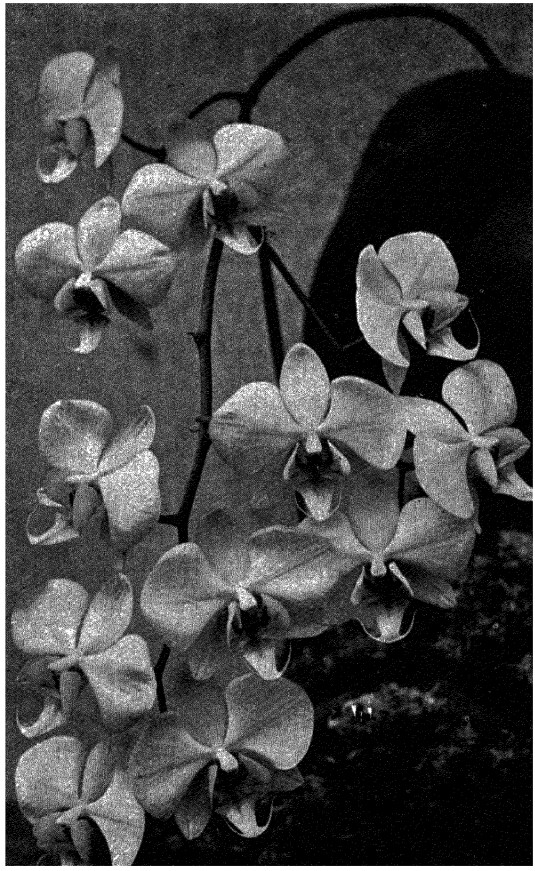


FIG. 149. PHALÆNOPSIS LEUCORRHODA CASTA (much reduced).

NATURAL HYBRIDS.

alcicornus *Schilleriana* and *amabilis*.
casta Syn. *leucorrhoda*.
delicata *intermedia* and *rosea*.
intermedia *Aphrodite* and *rosea*.

Phalœnopsis.

intermedia Brymeriana *Aphrodite* and *rosea.*
intermedia Porteii *Aphrodite* and *rosea.*
leucorrhoda casta (Fig. 149) *Aphrodite* and *Schilleriana.*
Valentini *cornu-cervi* and *violacea.*
Veitchiana *Schilleriana* and *rosea.*

PHOLIDOTA.

Inconspicuous and botanically interesting Orchids, belonging to the tribe *Epidendreæ*, and natives of India and the Malayan Archipelago, extending as far as Southern China. Lindley bestowed the generic name, which is derived from *pholis*, a scale, and *ous*, *otis*, an ear, and is in allusion to the scaly, ear-like bracts of the spike. It is commonly known as the Rattlesnake Orchid. Flowers small, shortly pedicellate, in terminal racemes; sepals carinate-concave, erect or spreading; petals usually smaller, slender, flat; lip sessile at the base of the column, concave and sub-saccate at the base, three-lobed; column sometimes very short; bracts ovate, imbricated, and persistent, or narrower and deciduous. Stems creeping, branched, with one- or two-leaved pseudo-bulbs. *P. imbricata* (*Hook.*) and *P. ventricosa* (*Rchb. f.*) are the two species usually met with in commerce. They require to be treated like *Lycaste.*

PHYSOSIPHON.

Epiphytal Orchids belonging to the tribe *Epidendreæ*, and of botanical interest only. The name given by Lindley is from *physao*, to inflate, and *siphon*, a tube; referring to the slightly inflated tube of the flowers. The three or four species in cultivation are natives of tropical America, and have the habit of *Pleurothallis.* Flowers small, in elongated racemes; sepals connate at the base into an ovoid or urceolate tube, which is three-fid at the apex; petals fleshy, ovate-cuneate; lip small, articulated with the base of the column, in form like the other petals; pollen-masses two, ovoid. These plants should be grown in shallow pans, in a compost consisting of equal portions peat and sphagnum, adding a little leaf-soil and sufficient rough sand or broken potsherds to maintain a porous

Physosiphon.

condition. They require a liberal amount of moisture while in an active state, and must not be allowed to suffer from want of root moisture at any season. They should be grown in the cool intermediate-house.

PHYSURUS.

Terrestrial leafy Orchids belonging to the tribe *Neottieæ*. They have usually fasciculate root-fibres, in a creeping rhizome, and inhabit the warmer parts of Asia and America. The name given by Richard is from *physa*, a bladder, and *oura*, a tail; in allusion to the shape of the spur. Flowers small or mediocre, disposed in loose or dense, often elongated, almost sessile spikes; sepals and petals nearly equal, the lateral sepals placed beneath the lip, and the dorsal one agglutinated to the petals; lip parallel with the column, concave, constricted below the apex, and extended downwards into the freely-swollen spur; column free or adnate to the bottom of the lip, straight, and attenuated into an ultimately bifid rostellum, having the anther at the back, containing two sectile pollen-masses, attached to an oblong or subulate gland. Leaves stalked, loosely-sheathed, often beautifully veined. The species require the same cultural conditions as *Anœctochilus*.

PILUMNA (*Lindl.*). A synonym of **Trichopilia.**

PLATYCLINIS.

Epiphytal Orchids belonging to the tribe *Epidendreæ*. The name given by Bentham is derived from *platys*, broad, and *clinis*, a couch; alluding to the broad membranous clinandrium. The species, which are natives of the East Indies and Malayan Archipelago, are better known in gardens under the name of *Dendrochilum*. The genus comprises about eight species, all of which require stove or East Indian-house treatment. They have stems tufted at the base, or sub-ramose and simple, and one-leaved towards the base, and scarcely thickened or narrowly pseudo-bulbous. Flowers small, in numerous terminal racemes, shortly pedicellate; sepals narrow,

Platyclinis.

spreading; petals similar or smaller; lip sessile, or shortly unguiculate at the base of the column, ovate, concave, almost equalling the sepals; column erect, semi-terete; anthers two-valved; pollen-masses four, ovoid. Leaves narrow, contracted into petioles.

The two species generally met with in cultivation, *P. filiformis* and *P. glumacea*, require to be grown in the warmest house available, and are best accommodated



FIG. 150. PLATYCLINIS GLUMACEA
(much reduced).

in shallow pans. Afford liberal drainage, and use a potting compost of good fibrous peat, sphagnum, leaf-soil, and a liberal sprinkling of rough sand or finely-broken crocks. During the active season of growth they require an abundant supply of water at the roots especially after the flower-scape is observed advancing with the expanding leaves. The atmosphere must also be kept in a highly humid state. Should red-spider be

Platyclinis.

observed while the new growth is advancing, it should at once be dealt with as advised on page 14. When growth is completed, the plants may be removed to drier and cooler conditions, where they should be afforded a perfect rest. Though the two species described below are the more noteworthy of those yet in commerce, there are several others procurable—*P. Cobbiana* (*Hemsl.*), *P. latifolia* (*Hemsl.*), and *P. uncata* (*Benth.*).

P. filiformis (*Benth.*).—Flowers pale yellow, small, in long, thread-like racemes, produced in summer. Leaves linear-lanceolate. Pseudo-bulbs small, conical. Philippines, 1836.

P. glumacea (*Benth.*).—Flowers white, very fragrant, sessile, in a linear-oblong, pendulous, elongated spike, borne on the curved peduncle in spring. Leaves solitary, broad-lanceolate, rather obtuse, striated, tapering into a long foot-stalk, which is enclosed by the sheathing scale. Pseudo-bulbs crowded, the younger ones clothed with two or more large, generally reddish scales, within which is a much larger, sheathing scale, 3in. to 4in. long, tinged with red. Philippines. This species should have a place in every Orchid collection. (Fig. 152; B. M., 4853, under name of *Dendrochilum glumaceum.*)

PLATYLEPIS.

Two or three species of terrestrial, warm intermediate-house Orchids, belonging to the tribe *Neottieæ*, are found in the above genus. The name given by A. Richard is from *platys*, broad, and *lepis*, a scale, and is in allusion to the shape of the sepals. Flowers narrow, in dense, sessile, glandular-pubescent spikes; sepals sub-equal, narrow; petals narrow, sub-coherent with the dorsal sepal; lip sessile at the base of the column, erect, concave-channelled. Leaves ovate or ovate-lanceolate, membranous, contracted into the petioles. Stems ascending, leafy. Rhizome creeping. *A. glandulosa* (*Rchb. f.*), the species generally grown, is confined to botanic collections.

PLEIONE (*D. Don*). This is now merged with **Cœlogyne.**

PLEUROTHALLIS.

An unwieldy genus of about 350 species of epiphytal Orchids, belonging to the tribe *Epidendreæ*. The name

Pleurothallis.

given by Robert Brown is from *pleuron*, a side, and *thallo*, to blossom; in allusion to the inflorescence. The species, which are natives of the West Indies and tropical America, are exceedingly variable, and belong to a class of botanically interesting, inconspicuous Orchids. Flowers small, sometimes very small, in a few species mediocre or rather large, often secund, in bundle-flowered racemes; sepals erect, connivent or somewhat spreading; petals shorter or narrower; pollinia two; labellum usually articulated at the base of the column. Stems filiform, one-leaved, often sheathed. The species succeed under the conditions recommended for the *Chimæra* section of *Masdevallia*.

P. ornata (*Rchb. f.*).—Though but a small-flowered species (less than ½in. across), this is a pretty one by reason of the margins of the sepals being densely fringed with white tendrils, that are agitated by the least touch or breath of air. Leaves about 1in. long. Colombia, 1890. (B. M., t., 7094.)

P. punctulata (*Rolfe*).—Quite one of the most distinct and attractive species of the genus. Flowers 1¾in. across. Sepals and petals light yellow, dotted with purplish-brown; lateral sepals united into a concave, oblong body, only the points being free; lip deep maroon, papillose above. Leaves lanceolate, oblong, 3in. to 3½in. long, very stiff and leathery. Stems about 2in. high. Colombia, 1885. (Fig. 153.)

P. Roezlii (*Rchb. f.*).—An attractive species with deep blood-purple flowers, five or six of which are produced in spring in a one-sided raceme; sepals 1¼in. long, the lateral ones connate with an ovate blade; lip tongue-shaped. Leaves oblong-lanceolate, 5in. to 8in. long, grass-green. Colombia, 1885.

PLOCOGLOTTIS.

Blume's name for a small genus of terrestrial stove Orchids, natives of the Malayan Archipelago, and belonging to the tribe *Vandeæ*. It is derived from *plokos*, a fold, and *glotta*, a tongue; in reference to a fold in the lip. Flowers mediocre, shortly pedicellate, racemose; sepals connate beneath the lip, larger than the petals, which are curved at the apex; lip connate with the column on either side by inflexed, membranous folds, its limb being convex, undivided, patent, at first erect; column



FIG. 153. PLEUROTHALLIS PUNCTULATA
(much reduced).

Plocoglottis.

free above; anthers two-celled; pollinia four, round, with two long, replicate caudicles; peduncles or scapes leafless. Leaves ample, membranous, plicate. Stem or rhizomes creeping, one- or many-leaved, not distinctly pseudo-bulbous at base. The three species that may be occasionally met with are *P. acuminata* (*Blume*), *P. javanica* (*Blume*), and *P. Lowii* (*Rchb. f.*). They require similar culture to *Cyrtopodium*.

PODOCHILUS.

A small genus of epiphytal Orchids, natives of the East Indies, belonging to the tribe *Vandeæ*. The name given by Blume is from *pous*, *podos*, a foot, and *cheilos*, a lip; the lip is joined to the column by a foot or stalk. Flowers small, often minute, disposed in terminal racemes; sepals erect, connivent; petals almost equal to the dorsal sepal, or narrower; bracts small. Leaves small, distichous. *P. longicalcaratus* (*Rolfe*) may be found in botanic collections. It requires East Indian-house treatment.

POGONIA.

Over thirty species (widely dispersed) of stove, terrestrial Orchids are included in this genus, founded by Jussieu, and belonging to the tribe *Neottieæ*. The name is from *pogonias*, bearded, referring to the fringed lip of some of the original species. Flowers solitary or loosely racemose, having free, conniving, or somewhat ringent sepals and petals, either all equal or the petals smaller; a free, erect, undivided or lobed lip, with its disk crested or papillose; a long semi-terete, clavate column, eared or winged at the top; and a sessile or very shortly-stalked two-celled anther, containing two furrowed pollen-masses. The plants have either one or a few sessile leaves upon an erect stem at the period of flowering, or are leafless till after flowering, and then produce a solitary, stalked leaf from an underground stem. The species thrive best in well-drained pots in a compost consisting of loam, leaf-soil, sand, and living sphagnum. Liberal root moisture is required during the growing season, and a thorough rest in a cool, airy position is advisable during the period in which the plants are in a dormant state.

Pogonia.

P. discolor (*Blume*), *P. Fordii* (*Hance*), *P. plicata* (*Lindl.*), and *P. punctata* (*Blume*), are species sometimes found in botanic collections.

POLYCYCNIS.

Some half-dozen species of warm intermediate-house epiphytal Orchids of the tribe *Vandeæ*, and allied to *Cycnoches* and *Mormodes*, are included in this genus, founded by Reichenbach (*fils*). The species are natives of Central America. The generic name is from *polys*, many, and *kyknos*, a swan; referring to the lip and column, which together bear some resemblance to a swan. Flowers large, pedicellate, in loose, floribund, often nodding racemes; sepals free, spreading, narrow; petals similar, or narrow and sub-stipitate at base; lip affixed to the base of the column, sometimes biauriculate. Leaves ample, plicate-venose, contracted into petioles. Scapes erect, few, sheathed, simple. *P. muscifera* (*Rchb. f.*), the species grown, requires the same cultural conditions as *Catasetum*, but is rarely met with in gardens.

POLYSTACHYA.

Hooker's name for a genus of epiphytal Orchids belonging to the tribe *Vandeæ*, and derived from *poly*, many, and *stachys*, a spike; alluding to the inflorescence of some of the species. Flowers usually small; sepals connivent or almost spreading, the dorsal one free, the lateral ones sometimes much broader, adnate to the foot of the column; petals similar to the dorsal sepal, or narrower; lateral lobes of the lip somewhat prominent, erect, the middle one spreading or recurved, and undivided; column sometimes very short; pollen-masses four; racemes many, short, forming a loose, narrow panicle, or solitary and simple, on a leafy stem; peduncle terminal. Leaves few, distichous, oblong or narrow, the base contracted into a sheath. The species, which are natives of tropical and Southern Africa, India, Ceylon, and Malaya, and sparingly represented also in tropical America, are rarely met with in cultivation outside botanic collections.

PONERA.

A small genus (five or six species) of epiphytal Orchids belonging to the tribe *Epidendreæ*, and natives of Central America and Mexico. Lindley's name is from *poneros*, miserable, and is in allusion to the appearance of the species. Flowers rather small, axillary, in tufts upon the young leafy or the old leafless stems; sepals erect, fleshy, the lateral ones largest, and connate with the elongated foot of the column; petals free; lip naked, two-lobed, wedge-shaped, articulate with the foot of the column, which is short and terete; anthers membranous, four-celled, containing four pollen-masses, adhering in pairs by means of two powdery caudicles. Leaves alternate, in two rows, almost grass-like. The species which are rarely seen in cultivation, require warm intermediate-house treatment, with cooler conditions during the resting season. *P. juncifolia* (*Lindl.*) and *P. prolifera* (*Rchb. f.*) are the two species sometimes found.

PRESCOTTIA.

In this genus of warm-house, terrestrial Orchids, belonging to the tribe *Neottieæ*, are to found upwards of a score of species, but only one (*P. stachyodes*) (*Lindl.*) is likely to be found even in botanic collections. The name given by Lindley is in compliment to John D. Prescott, a botanist of St. Petersburgh. Flowers small, spicate, sub-sessile; lateral sepals connate with the lip into a sac; lip fleshy, cucullate, and entire, with a couple of ears at its base. Leaves clustered at the base of the stem, or radical, sessile, or long-stalked, small or ample, membranous. The species are natives of tropical America.

PROMENÆA (*Lindl.*). This is now included under **Zygopetalum.**

PTEROSTYLIS.

Robert Brown founded this rather large genus of greenhouse, terrestrial Orchids, belonging to the tribe *Neottieæ*. The name from *pteron*, a wing, and *stylos*, a column, is in allusion to the broadly-winged column. The species are

Pterostylis.

mostly natives of Australia and New Zealand. Flowers usually green, often tinged and streaked with red, large and solitary, or smaller and racemose, on short pedicels; dorsal sepal broad, erect, incurved; petals curved under the dorsal sepal, and forming with it an arched, almost hood-shaped upper lip, or helmet; lateral sepals more or less united in a two-lobed narrow lip, often terminating in long points; lip on a short claw at the end of the basal projection of the column. *P. curta* (*Lindl.*), a species sometimes found in botanic collections, succeeds in a compost of leaf-soil and rough peat.

RENANTHERA.

Of this genus of tropical epiphytes belonging to the tribe *Vandeæ*, only five or six species are known. The name given by Loureiro is derived from *ren*, a kidney, and *anthera*, an anther; alluding to the reniform shape of the anthers or pollen-masses. Many of the plants described as Renantheras are Arachnanthes. The species have slender, sometimes branching stems, occasionally 12ft. to 14ft. high, bearing a row of leaves on either side. The flower-stems originate at the nodes, and bear the blossoms in panicles or drooping spikes. The segments of the flower are spreading; the lip is small, and attached to the base of the column, on the under side is a short, conical spur. The species are natives of India, China, and the Malay Archipelago.

Culture.—From March to October—which is the growing season of the species described—the plants require the hot, moist atmosphere of the stove. They are very free-rooting, and *R. coccinea* should be fastened on a block of fern-stem or wood, to which it will soon become firmly attached by its roots. Birch-wood has been recommended for the purpose, but we prefer the stem of a Tree-fern, such as *Dicksonia antarctica*, the soft, spongy roots holding the moisture and agreeing with the roots of the Renanthera. Grown in this manner, the plants require to be moistened once or twice a day in summer, under which treatment the stems will lengthen 1ft. or more in a season. Only during the hottest sunshine should they be shaded, a free exposure to the light being most important if

Renanthera.

flowers are to be obtained. The potting compost should consist wholly of sphagnum. The pots should be of good size and drained to two-thirds their depth. The plants require an abundance of heat and moisture when growing. The species, when at rest, should have only just sufficient water to prevent the foliage from shrivelling.

R. coccinea (*Lour.*).—Owing to the difficulty of many to flower this species, it is not a popular plant in gardens; it is, however, very easily grown, and when in blossom is a magnificent sight. It is of climbing habit, and in its native country clings to the trunks of trees by the white, fleshy roots emitted from the slender stem, which is round and scarcely the thickness of a man's finger. The strap-shaped, dark green leaves are arranged in two rows, and are 4in. to 5in. long, and notched at the tips. The flowers are 2in. to 3in. in depth, and are somewhat sparsely produced in loose, branching racemes, measuring 2ft. to 3ft. through at the base. The upper sepal and the two petals are strap-shaped, blunt at the tips, and coloured deep red, blotched with orange. The two lower sepals are larger, and form the most conspicuous part of the flower, being of a deep crimson, marked with paler transverse lines; in shape they are oblong, slightly widened towards the apex, with undulated edges. Both sepals and petals on the outside are orange-coloured, changing to red at the margins. The lip is small, the front and sides being deep crimson, and the throat white; it is furnished with a pointed, conical spur. This species was introduced from Cochin China in 1816, and it is recorded as having flowered for the first time in 1827. (B. M., tt. 2997 and 2998.)

R. Imschootiana (*Rolfe*).—Flowers reddish-vermilion and yellow, simply racemose, somewhat resembling those of *R. coccinea*, but having shorter perianth segments. The plant is very compact, and is best grown in baskets. Assam, 1892.

R. Lowii (*Rchb. f.*).—A synonym of *Arachnanthe Lowii*.

R. matutina (*Blume*).—Flowers at first of a beautiful blood-red, paler outside; disk of the lateral sepals golden; base of the petals striped with dark purple; lip very minute, dark purple; panicles much-branched, 2ft. to 3ft. long; peduncles intense purple. Sunda Isles.

R. Storeii (*Rchb. f.*).—Flowers more than 2in. across; sepals and petals dark orange, the lower sepals broad, of a brilliant velvety-crimson, with lighter shades of the same colour; lip small, deep crimson, with small yellow bars, centre white. The most desirable species of the genus. Philippines, 1880.

RESTREPIA.

About twenty species of *Restrepia* (*H. B. K.*) are known, all being natives of tropical America; they belong to the tribe *Epidendreæ*. The name is given in honour of Joseph E. Restrep, a naturalist who travelled in South America. The majority are inconspicuous plants, and are not usually considered worthy of cultivation; but those here described are exceptions—indeed, they may be classed among the gems of the smaller cool-growing Orchids. Their curious structure gives them also an additional charm. The slender stems are produced in tufts, and each carries a single leaf. The flowers in all the species are borne on one-flowered scapes at the top of the stem, which continues to blossom for several years. The plants are found on mossy trees, at considerable elevations on the Andes. The genus is allied to *Masdevallia*.

Culture.—The cultivation of Restrepias is very simple, no Orchids adapting themselves to artificial treatment more readily. They should be placed in the cool-house, under conditions similar to those recommended for the cooler Masdevallias. They succeed well when planted in baskets, in a compost of peat and sphagnum, and should be suspended from the roof. Water is required in smaller quantities in winter, but no attempt at resting should be made.

R. antennifera (*Lindl.*).—A synonym of *R. maculata*.

R. elegans (*Karst.*).—In everything except size this resembles *R. maculata*. Its stems are only 2in. to 3in. high, clothed with pale green scales, and bearing an apical, solitary oval leaf 1in. to 2in. long, leathery in texture, dark green on the upper surface, and paler beneath. The flowers are borne on slender, filiform stalks about 2in. in length. The dorsal sepal is lance-shaped, white, streaked with purple, the upper part being drawn out into a yellow tail, with a club-shaped tip; the petals are similar, but only half the size; the two lateral sepals are joined so as to form an oblong, concave blade, which is yellow, marked with numerous purple dots. The whole flower measures from 1½in. to 2in. vertically. Venezuela, 1850. It flowers in January and February. (B. M., t. 5966.)

R. maculata (*Lindl.*).—This lovely little plant has slender stems 4in. to 6in. high, each surmounted by a single heart-shaped leathery leaf 2in. to 4in. long. The flower-scapes—

Restrepia.

several of which are produced at the top of each stem—are about 4in. in length, very slender, and bear each one flower of exquisite beauty. The upper sepal is 1½in. long, and thread-like, except at the base, and it has a little knob on the tip; in colour it is yellow and purple. The petals are similar in shape and colour, but are much smaller and antenna-like. The lateral sepals are the prominent feature of the flower; they are united by their inner margins, except near the apex, and form one oblong segment 1½in. long, which is yellow, beautifully marked with longitudinal lines of purplish-crimson. The lip is similarly coloured, but small and inconspicuous. This species grows on the trunks of trees, at an altitude of 6000ft. to 12,000ft., in Colombia, and was introduced in 1869. It flowers from November to February. Syn. *R. antennifera*. (B. M., t. 6288.)

R. pandurata (*Rchb. f.*).—Smaller even than *R. elegans*, this charming little plant blooms very freely, and is at least as attractive in the size and markings of its flowers as any of the pigmy Orchids. The stems are 2in. high, inclosed in thin sheaths, and each bears a stiff, leathery, ovate leaf 2½in. long, deep green above, purplish beneath. The flowers are produced in the same manner as in *R. elegans*, and are similar in size. The tail of the upper sepal is short; the lower sepals are white, with numerous bright crimson spots; the lip is fiddle-shaped, and has a bristle on each of the side lobes. This species first flowered in the Botanic Gardens at Glasnevin in 1887. Colombia.

R. striata (*Rolfe*).—This species differs from all others in having striped instead of spotted sepals. Otherwise it resembles *R. elegans*. It is a most beautiful little Orchid, flowering freely in spring. Colombia, about 1890. (B. M., t. 7233.)

RHYNCHOSTYLIS.

Blume's name for a small genus of epiphytal Orchids, of the tribe *Vandeæ*. It is derived from *rhynchos*, a beak, and *stulos*, a pillar, and is in allusion to the shape of the column. Flowers rather large or mediocre, shortly pedicellate; lateral sepals broader than the dorsal one; lip affixed to the column, deeply saccate at the base, with obsolete lateral lobes; column short, thick; racemes lateral, long, dense-flowered. Leaves distichous, coriaceous or fleshy, flat; sheaths persistent, concealing the stem. *R. cœlestis*

Rhynchostylis.

(*Rchb. f.*) and *R. retusa* (*Blume*) are best known in gardens as Saccolabiums, and they require similar cultural conditions.

R. cœlestis (*Rchb. f.*).—The flowers of this species are crowded, ¾in. across, and on white or pale blue pedicels; the sepals are white, with an indigo-blue apical blotch; the basal half of the blade of the lip is white, the apical half indigo-blue; the column is very short. The leaves are fleshy, 4in. to 6in. long. The stems are stunted. Siam, 1885. Syn. *Saccolabium cœleste.* (L., t. 300; W. O. A., viii., t. 361.)



FIG. 154. RHYNCHOSTYLIS RETUSA (much reduced).

R. retusa (*Blume*).—In this pretty species the flowers are white, striped with violet-pink; the petals are half as wide as the ovate sepals; the lip is one-coloured, with a compressed, truncate-conical spur, the lamina being lanceolate, inflexed, slightly costate at the back; the racemes are cylindrical and dense. Syns. *Saccolabium Blumei* (L. S. O., t. 47), *S. guttatum* (B. M., t. 4108), *S. præmorsum*, and *S. retusum.* (Fig. 154.)

RODRIGUEZIA.

Ruiz and Pavon's name for a small genus of epiphytal Orchids belonging to the tribe *Vandeæ*, and for the most part natives of the warmer parts of Brazil. The generic name is a commemorative one, in honour of Em. Rodriguez, a Spanish physician and botanist. As at present constituted, the genus includes *Burlingtonia.* The species are few in number, and chiefly to be found in botanic collections. The pseudo-bulbs are small, flattened, and usually two-leaved. Leaves sheathing at the base, stiff

Rodriguezia.

and leathery in texture, not more than 6in. long. Flower-scape from the base of the pseudo-bulb, bearing numerous flowers, which have short sepals and petals, arranged in a more or less tubular manner. The lip is large and spreading, with a short, horn-like spur at the base.

Culture.—All may be grown in small teak baskets suspended from the roof of the intermediate-house, and liberally watered whilst making new growth. In winter they require less water, but the plants must not be allowed to get quite dry. When basketing them, first fasten them securely upon small pieces of teak, then fill the basket with crocks, and cover the whole thinly with a layer of living sphagnum.

R. candida (*Batem.*).—For basket-culture this compact plant, the type of the genus, is well suited. The leaves are firm in texture, and dark green. The gracefully drooping racemes are produced from the axils of the leaves; they bear four to six very handsome flowers, which are snowy white, with a slight stain of yellow on the upper part of the lip, "in substance and appearance like white satin trimmed with gold." It blooms during April and May, lasting about three weeks in perfection, and is very fragrant. Demerara, 1834. (B. R., xxiii., t. 1927, as *Burlingtonia candida.*)

R. crispa (*Lindl.*).—A synonym of *Gomeza crispa.*

R. decora (*Rchb. f.*).—This has a long, slender, rooting rhizome, bearing small, oval pseudo-bulbs, each having a single leaf. A lesser leaf appears at the base of a bulb, and from the axil of this the scape springs. The flower-stems are erect, bearing from five to ten blossoms, which are white or pale rose-coloured, spotted with red, except the large, spreading lip, which is pure white. The straggling rhizomes must be tied into position, so as to bring the roots from the base of the pseudo-bulbs under the influence of the basket or block. It blooms during May and June, lasting for a long time in full beauty. It is a native of St. Paul's, Brazil, whence it was introduced in 1852. (B. M., t. 4834.)

Var. *picta* has deeper-coloured flowers, and blooms in the autumn. (B. M., t. 5419, as *Burlingtonia decora.*)

R. fragrans (*Rchb. f.*).—On account of the hawthorn-like fragrance of its flowers, this beautiful plant is a great favourite. It forms a compact tuft, with rigid, dark green leaves, and erect racemes of large flowers; the latter are pure white, save the middle of the lip, which is stained with yellow. The flowers are borne in April and May, lasting in perfection about three weeks.

Rodriguezia.

It is a native of Brazil, where it grows on the highest branches of the Cedrela-trees, and fills the forest with its fragrance. Introduced in 1850. Syn. *Burlingtonia fragrans.*

R. venusta (*Rchb. f.*).—This forms a compact mass of stems and dark green foliage; the flowers are white, lightly tinted with pink, the lip being stained with yellow; they are produced in heavy, pendulous clusters. It blossoms at various periods of the year, and is a native of Brazil. (L. S. O., t. 12, as *Burlingtonia venusta.*)

SACCOLABIUM.

Amongst the smaller-flowered Orchids of tropical regions cultivated in this country, the genus *Saccolabium* (*Blume*) assuredly occupies the first place. It belongs to the tribe *Vandeæ.* In the majority of the species the flowers are individually small—rarely, indeed, more than 1in. in diameter—but any deficiency in size is amply compensated for by the profusion in which they are produced; whilst for delicacy of colour, fragrance, and display they are unsurpassed. At the present time the species known number between thirty and forty. Almost every one is attractive enough to be worth cultivating, whilst many are of exquisite beauty. They are dwarf, evergreen plants, with fleshy, channelled (rarely terete) leaves, arranged in two opposite rows on the upright stem. In the majority the flowers are numerously and closely set on upright or pendulous racemes that spring from the axils of the leaves. In some species, as in *S. bellinum*, the flowers are few, but comparatively large, and are arranged in a corymb, or head. The spreading sepals and petals are mostly alike in size and colour, the salient feature of the flower being the lip, which is attached to the base of the column, and is prolonged downwards, forming a spur or a pouch, a character on which the generic name is founded—from *saccus*, a bag, and *labium*, a lip. The species are scattered over tropical India, Burma, and the Islands of the Malayan Archipelago.

Culture.—In their natural state Saccolabiums grow on the upper branches of trees in some of the hottest and most humid regions in the world; under cultivation they therefore require stove treatment. During the growing season,

Saccolabium.

which extends from March to October, a temperature ranging from 70deg. to 80deg. is needed, whilst on very hot days it may safely be allowed to rise considerably higher. When growth has fairly commenced, the plants must be kept uniformly moist at the root, and the atmosphere as saturated as is consistent with adequate ventilation. The walls, floor, staging, and, in fact, every available space, should be frequently wetted, and towards evening on the brightest days a fine spray may be distributed over the plants with a syringe. One of the commonest errors in the cultivation of Saccolabiums is that of keeping them too much shaded. Only during hot sunshine is it necessary to let down the blinds. For this reason it is a convenient arrangement during the season of growth to place the plants on the same side of the house as the Dendrobiums. They thrive best when suspended about 8in. from the roof-glass, and should be planted in teak baskets, partly filled with clean potsherds, finishing at the top with a good layer of live sphagnum.

About the end of February the roots become green at the tips, and commence to lengthen. As soon as this is observed, the old sphagnum should be removed and replaced with new, at the same time cutting off decayed roots, and thoroughly cleansing the plants. If, as is usually the case, the roots are clinging to the basket, they ought not to be disturbed; the old material may be readily washed out with a syringe.

During winter Saccolabiums should be subjected to much cooler and drier conditions. The temperature may range from 55deg. or 60deg. at night to 65deg. by day, and much less water is then required. It is remarkable how little water is required during the resting season. Oftener than not failure to cultivate Saccolabiums successfully may be traced to liberal treatment in respect of moisture during the resting season.

S. ampullaceum (*Lindl.*).—A dwarf and pretty species, flowering in early summer, that deserves to be grown in every warm-house, where it should have a position within a few inches of the roof-glass. Stem erect, from 6in. to 8in. high, on which are closely set, in two opposite rows, the short, strap-shaped, channelled leaves, the deep green surface of which is thickly and minutely dotted with dull purple. The erect racemes

spring from the axils of the leaves, and are from 4in. to 6in. high. The flowers are crowded on the racemes, each being ¾in. across, and of a deep magenta-rose colour; the lip is furnished with a pale rose-coloured, cylindrical spur. India, 1837. (B. M., t. 5595.)

Var. *moulmeinense* is superior to the type by reason of its stronger growth, its larger flowers, and longer racemes.

S. bellinum (*Rchb. f.*).—Specially worthy of notice is this species as bearing the most remarkable flowers of any Saccolabium as yet introduced. It also represents that section of the genus with large but comparatively few flowers arranged in a corymb. The leaves are produced in the distichous manner characteristic of the whole genus, are pale green, 6in. to 8in. long, 1in. broad, and notched at the ends. The racemes bear from three to seven flowers, each of which is 1½in. in diameter and fleshy in texture; the sepals and petals are ovate, with acute points, and are coloured olive-green, with numerous blotches of rich brown; the basal part of the lip is in the shape of a cup, with a horizontal, ledge-like margin, measuring 1in. across, deeply fringed, and pure white, except on the centre, where there is a patch of bright yellow; the cup itself is white, dotted inside with mauve. Introduced from Burma, in 1884, by Messrs. Hugh Low and Co. It flowers during the first three months of the year, and is one of the most attractive Orchids in blossom at that season. (B. M., t. 7142.)

S. Blumei (*Lindl.*).—A synonym of *Rhynchostylis retusa.*

S. cœleste (*Rchb. f.*).—A synonym of *Rhynchostylis cœlestis.*

S. curvifolium (*Lindl.*).—When in bloom, this small, free-flowering species is very pretty. The linear, curved leaves are channelled, rigid, narrowing to the apex, where they are equally bilobed. The racemes are erect, about 6in. high, and densely clothed with sparkling, bright orange-scarlet flowers, about 1in. in diameter; the upper sepal and the petals are obovate; the lateral sepals are broader at the base. A bright effect is given to the flowers by the violet anther-case. A native of Nepal, Burma, and Java; introduced about 1860. It flowers in May and June. (B. M., t. 5326, as *S. miniatum.*)

Var. *luteum* has bright yellow flowers; otherwise it is similar to the type. It is rarely met with.

S. giganteum (*Lindl.*).—A large and handsome species that should be in every collection. The leaves are borne on a short, erect stem, and are 1ft. long, 3in. wide, firm in texture, and obliquely notched at the ends. The cylindrical, pendent racemes

are 1ft. in length, and about 3in. through, bearing numerous closely-packed flowers, each slightly over 1in. across; the sepals and petals are cream-coloured, with a few bright purple spots, usually near the base. The lip is wedge-shaped, the apex being divided into three rounded lobes; it is of a deep amethyst-purple, with veins of a darker shade. This species blossoms during winter and early spring, its beautiful and exquisitely fragrant flowers remaining perfect for a month or six weeks after opening. It was first introduced in quantity from Rangoon by Messrs Veitch in 1866, although a few plants were known in cultivation for a considerable period previously. (B. M., t. 5635.)

Var. *illustre* has leaves of larger size, and longer racemes. The flowers are not so closely arranged, but they are larger, and the colour of the lip is more brilliant. Cochin China, 1882. (L. t. 83.)

S. guttatum (*Lindl.*).—A synonym of *Rhynchostylis retusa.*

S. Harrisonianum (*Low*).—A variety of *S. violaceum.*

S. Hendersonianum (*Rchb. f.*).—One of the prettiest of the dwarf species, well worth growing alike for its beauty and for its distinct character. The leaves are 5in. to 6in long, strap-shaped, leathery, and although set in a distichous manner on the stem, spread irregularly in various directions. The raceme is 6in. in height, the numerous flowers forming an upright, cylindrical mass. The flowers are ⅜in. in depth; the sepals and petals are of a bright rosy-red; the lip is white, and consists of a cylindrical spur, at the mouth of which are three small teeth. A native of Borneo. This species is stated to have been introduced into Europe in 1862, but it did not flower in this country until 1874. (G. C., iv., 1875, p. 356; B. M., t. 6222.)

S. Huttoni (*Hook. f.*).—A compact-growing species, with flowers in a rather open raceme, 1ft. long; sepals and petals rose; lip white, reduced to little besides the spur. Leaves 6in. long, ligulate, keeled, bright green. Borneo, 1862. Syn. *Aërides Huttoni.* (B. M., t. 6222.)

S. miniatum (*Lindl.*).—Very similar in all its parts to *S. curvifolium*, differing only in the flowers, which are bright orange-red, and are produced in short, compact racemes, and in the smaller structure of the foliage. It blooms in spring. Native of Java. (B. M., t. 5326.)

Var. *citrinum.*—A fine variety, with a rich, dense inflorescence of lemon-coloured flowers, having a dark centre. Philippines.

S. præmorsum (*Lindl.*).—A synonym of *Rhynchostylis retusa.*

S. retusum (*Voigt.*).—A synonym of *Rhynchostylis retusa.*

Saccolabium.

S. violaceum (*Lindl.*).—This has leaves 10in. to 12in. long and 2in. wide, borne in two opposite rows on an erect stem; they are of a dark green colour, with longitudinal lines of a deeper shade, and are distinctly two-lobed at the tips. The flowers are numerous, on pendulous racemes 1ft. or more long, each flower being 1in. in diameter. The sepals and petals are white, spotted with pale mauve; the lip is dark mauve, marked with about six lines of a yet deeper shade proceeding from the base. Philippines, 1839. The blossoms usually appear in January and February, and remain in good condition for about a month. (B. R., 1847, t. 30)

Var. *Harrisonianum* has ivory-white and very fragrant flowers. Imported plants have borne old flower-racemes 2ft. in length, but under cultivation they are only about half as long. Syn. *S. Harrisonianum.* (B. M., t. 5433.)

S. Wightianum (*Lindl.*).—The plant sometimes listed as above is *Aërides radicosum.*

SARCANTHUS.

Warm-house, epiphytal Orchids belonging to the tribe *Vandeæ.* Lindley's name is from *sarx*, *sarkos*, flesh, and *anthos*, a flower; referring to the substance of the flowers. The species are natives of the East Indies, South China, and the Malayan Archipelago. Flowers often yellowish-green, purplish within, small, shortly pedicellate; sepals and petals free, sub-equal, spreading, slightly fleshy; lip affixed to the base of the column, spreading, spurred at the base, the lateral lobes short, ear-like, or oblique, the middle one ovate, oblong, or lanceolate; column oblong, sub-terete; pollen-masses four; peduncles lateral, often slender, simple or paniculately branched. Leaves distichous, coriaceous or fleshy, flat or terete. Stems leafy, not pseudo-bulbous. The species are of botanic interest.

SARCOCHILUS.

Warm intermediate-house, epiphytal Orchids belonging to the tribe *Vandeæ.* The name, given by Robert Brown, is from *sarx*, *sarkos*, flesh, and *cheilos*, a lip; alluding to the fleshy lip. The species generally are of botanic interest, and are rarely met with in cultivation. They are natives of the East Indies, Malayan Archipelago, Pacific Islands, and Australia. Flowers mediocre or

Sarcochilus.

small; sepals and petals spreading, the lateral sepals often more or less adnate to the foot of the column; lip without a spur, three-lobed, the lateral lobes petaloid or tooth-like, the middle one variable, fleshy; column erect; pollen-masses two, globose, or four more or less connate, in a pair; peduncles lateral, simple or rarely branched. Leaves coriaceous or fleshy, oblong or linear, distichous, or sometimes very few or deficient. The plants require liberal moisture, both at the root and in the atmosphere, during the growing season; while at rest only sufficient moisture should be given to maintain them in their normal concondition. The genus is also known as *Thrixspermum*.

SARCOPODIUM (*Lindl.*). *See* **Bulbophyllum** and **Dendrobium.**

SATYRIUM.

Stove, greenhouse, or half-hardy, terrestrial Orchids, belonging to the tribe *Ophrydeæ*. The name given by Swartz is from *saturos*, a satyr; alluding to the supposed aphrodisiacal properties. The species are natives of the East Indies, the Mascarene Islands, and, for the most part, of Southern and tropical Africa. Flowers mediocre, or rather large, rarely small, in dense spikes; sepals and petals free, much spreading or reflexed; lip sessile at the base of the column, broad, concave, galeate or cucullate, undivided, double-spurred, or bisaccate; bracts membranous or somewhat leafy. Leaves few on the lower parts of the stem, rarely many at the sides of a tall stem. Tuber undivided. Many of the species will thrive under the same conditions as those recommended for *Disa*. They are rarely met with in cultivation.

SAUNDERSIA.

This monotypic genus, of the tribe *Vandeæ*, was founded by the younger Reichenbach, the name being a complimentary one to Mr. W. W. Saunders, an ardent collector of rare and curious plants. *S. mirabilis* is a stove epiphytal Orchid seldom seen in cultivation. It is greenish-yellow, flushed with yellow and purple, and is produced upon a very short, one-leaved stem, that is scarcely or not at all pseudo-bulbous.

SCAPHOSEPALUM.

Pfitzer's name for a small genus of cool-house Orchids belonging to the tribe *Epidendreæ*, and formerly included under *Masdevallia*. They differ from Masdevallias in having the dorsal sepal free, the lateral ones forming a boat-shape under the lip, which is strongly recurved and curled up—hence the generic name from *skaphe*, a boat, and *sepalum*, a sepal. The species are chiefly of botanic interest. Occasionally met with in cultivation are species like *S. anchoriferum* (*Rolfe*), *S. breve* (*Rolfe*), *S. gibberosum* (*Rolfe*), and *S. swertiæfolium*, generally under the name of *Masdevallia*.

SCAPHYGLOTTIS.

Under this name is found a small genus of stove epiphytal Orchids belonging to the tribe *Epidendreæ*. The generic name, given by Poeppig and Endlicher, is from *skaphe*, a boat, and *glotta*, a tongue; in allusion to the hollowed lip. Popularly this genus is known as the Boat-Lip Orchid. The species are natives of South America. Flowers small, twin or few in a fascicle; lateral sepals prolonged at the base, and often connate at the foot of the long, erect column; petals similar; lip narrow, continuous with the column and turning up so as to be parallel with it. Leaves narrow, coriaceous. Stems slender, straggling. Pseudo-bulbs borne in the axils of the leaves. *S. Behri* (*Hort.*) is sometimes found in cultivation.

SCHOMBURGKIA.

There are about twelve species belonging to this genus, of the tribe *Epidendreæ*, the name given by Lindley being in compliment to Sir R. Schomburgk. All the species are natives of tropical America, and are epiphytal, with erect stem-like pseudo-bulbs—which in some species are hollow—bearing at the top from one to three leathery leaves. When not in flower some of them closely resemble certain species of *Cattleya* or of *Lælia*. The flower-stems are produced from the apex of the pseudo-bulbs, and are remarkable for the length to which they occasionally grow —in *S. tibicinis* as much as 8ft. The flowers are showy,

with spreading, undulated sepals and petals, and a three-lobed lip, the side lobes of which are more or less incurved. Some of the species are extremely beautiful—notably, the finest form of *S. tibicinis.*

Culture.—Unfortunately, Schomburgkias do not flower with freedom under cultivation. We should not, therefore, recommend them to the amateur until he has had some practice in the management of more easily-flowered Orchids. They are found to thrive best when grown in pots half-filled with drainage, in a compost of fibrous peat and sphagnum. During the period of most active growth they may be placed in the hottest house, giving them, at that time, abundance of water at the roots. When the pseudo-bulbs attain their full size, the plants should be removed to the intermediate-house to ripen off, and the supply of water be gradually reduced, finally withholding it altogether. Growing most frequently on the upper branches of trees, fully exposed to the tropical sun, these plants require but little shade. During summer it is convenient to give them a place adjoining the Dendrobiums, and in winter one near the Cattleyas. They may also be grown on large blocks: the preceding method, however, is a preferable one.

S. carinata (*Griseb.*).—A synonym of *S. Lyonsii.*

S. Lyonsii (*Lindl.*).—An easily-grown, interesting, and handsome species. The pseudo-bulbs are fusiform, about 1ft. high, and bear at the top two or three linear-oblong, leathery leaves. The racemes are erect, and bear from twelve to twenty-five flowers, each 2in. across; the sepals and petals are lance-shaped, white, with several rows of purple dots and lines; the lip is recurved at the apex, white, brownish-yellow at the margin, the disk having several elevated, longitudinal lines, spotted with purple. This is a native of Jamaica, where it grows on the branches of trees, and on rocks exposed to the full sun. A notable character of the flowers is their habit of self-fertilisation—an unusual occurrence amongst Orchids. The anther-cells open shortly after the expansion of the flower, thereby allowing the first wind to shake out the pollen-masses upon the viscid stigma. Introduced in 1853. The flowers are produced in August. Syn. *S. carinata.* (B. M., t. 5172.)

S. Thomsoniana (*Rchb. f.*).—The tapering pseudo-bulbs of this lovely species are similar to those of *S. tibicinis*, but dwarfer. The sepals are strap-shaped, somewhat wavy, light yellow; the petals are pale sulphur-yellow, with purple streaks on the outside;

Schomburgkia.

the side lobes of the lip are triangular, rounded, the central one ligulate, notched at the apex, and prettily crisped; the disk is blackish-purple, the apex white. West Indies, 1886. The flowers are produced during the summer months.

S. tibicinis (*Batem.*).—The largest, the best-known, and probably the handsomest of the genus. The pseudo-bulbs are 1ft. to 1½ft. long, hollow, tapering from the bottom upwards, their curious structure giving rise to the popular name of Cowhorn Orchid. In a wild state the plants are usually occupied by swarms of ants. The leaves are two, sometimes three, in number, oblong, leathery, and produced near the top of the pseudo-bulb. The raceme is terminal, 4ft. to 8ft. high, bearing numerous flowers on the upper part; the flowers are 3½in. across, the sepals and narrower petals prettily undulated, narrowly oblong; the outside is pale purple, the inside crimson-purple, reddish-brown towards the tips; the side lobes of the lip are orange, streaked with purple, white at the margin, the small middle lobe being white, with purple veins. There is, however, considerable variation in colour and size, the form just described being sometimes distinguished as *grandiflora*. A smaller-flowered variety is in cultivation, with blossoms 2in. in diameter, the side lobes of the lip being rosy, and the front lobe a purer white. Honduras, 1836. The flowers appear in summer. (Fig. 155, for which we are indebted to the Editor of the "Gardeners' Chronicle"; B. M., t. 4476.)

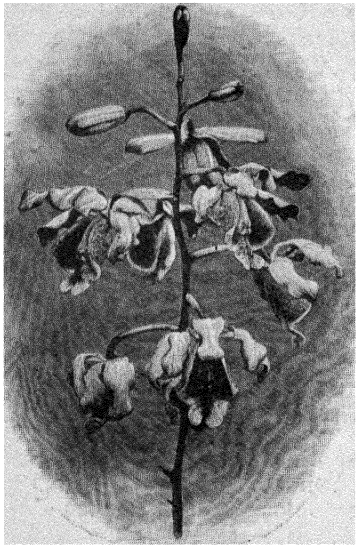


FIG. 155. SCHOMBURGKIA TIBICINIS (much reduced).

SCUTICARIA.

The two or three species that constitute this genus, belonging to the tribe *Vandeæ*, are amongst the most

Scuticaria.

interesting and remarkable of all Orchids. Very closely allied in the construction of their flowers to *Maxillaria*, they are totally distinct in their long, pendent, terete, whip-like leaves (hence Lindley's name from *scutica*, a whip), and short, ringed stems. The flowers, which are large and strikingly handsome, occur on short stalks, not more than two or three together; the large sepals and somewhat smaller petals are spreading, the bases of the two lower sepals being united to form a chin. The lip is concave, trilobed, differently coloured from the rest of the flower. The species are natives of tropical South America.

Culture.—Scuticarias are found in a natural state growing upon trees, and they prove most satisfactory under cultivation when treated as epiphytes. They should be fastened on blocks of teak, or placed in baskets or shallow pans. *S. Hadweni* thrives in an intermediate-house; the others should have a place in the stove. When grown on blocks we find that they do best hung against a moist back wall where they obtain plenty of direct sunlight. During winter little water is necessary: sufficient, however, should be given to prevent shrivelling. In summer the blocks should always be moist; they may be syringed two or three times on sunny days.

S. Hadweni (*Benth.*).—A very handsome and interesting species, with terete, dark green, usually pendent leaves, 1½ft. long, pointed, grooved on one side; they are neither so long nor so flexible as those of the better-known *S. Steelii*, and may occasionally be seen growing erect. The flowers are produced singly on short scapes, and measure upwards of 4in. at their widest diameter; the sepals and petals are oblong, pointed, greenish-yellow, boldly blotched with reddish-brown. The lip is 1½in. broad, the sides being turned up and the margin wavy; it is white, blotched with pale rose, contrasting prettily with the rest of the flower. At Kew a healthy example of this plant has for many years been grown in a sunny position in an intermediate-house, where it thrives and flowers regularly. This species deserves a more extended cultivation. It is a native of Brazil, and was introduced in 1851, when it was known as *Bifrenaria Hadweni*. (B. M., t. 4629.)

Var. *bella* is a beautiful variety, with sepals and petals yellowish outside, bright crimson spotted and blotched with pale sulphur inside; lip white, spotted with light brown on the disk and side lobes, and with mauve on the front lobe.

Scuticaria.

Var *pardalina* is a rare and equally beautiful variety, with brown circular markings on the sepals and petals.

S. Steelii (*Lindl.*).—Although terete leaves are not infrequently met with amongst Orchids, in no species do they attain such a length, or afford such a distinctive character, as in this. They are occasionally 4½ft. long, a little thicker than a goose-quill, flexible, channelled on one side. The flowers are very handsome, and in good varieties measure 4in. in diameter, from one to three occurring on each scape; the sepals and petals are broad-oblong, overlapping, pale yellow, freely blotched with chocolate; the lip is large, three-lobed, creamy-white, handsomely striped with brownish-purple. British Guiana, 1834. The flowers are produced at all seasons. (B. M., t. 3573.)

SELENIPEDIUM.

In gardens this genus of stove terrestrial Orchids, of the tribe *Cypripedieæ*, is included with *Cypripedium*, from which it differs in having a three-celled and three-furrowed or three-lobed ovary. The species are natives of the mountainous parts of South America. Reichenbach's name is from *selenis*, a little crescent, and *pedion* or *podion*, a slipper; in allusion to the crescentic, slipper-shaped lip. The cultural requirements will be found under *Cypripedium*. The genus includes *Uropedium*.

S. Boissierianum (*Rchb. f.*).—A rare as well as an interesting plant. The foliage is narrow, grass-like, 1ft. to 2ft. long, somewhat recurved, and shining green. The scape is erect, as long as the leaves, branching, many-flowered, the flowers expanding in slow succession. The flower is 6in. across; the dorsal sepal is narrow, curved forwards, crisp-edged; the petals are 3in. long, ¼in. broad, crisp-edged and twisted, and they stand out horizontally; the pouch is 1½in. long, 1in. broad, rounded and smooth like an egg, save at the mouth, where it is curiously cut. Each flower is subtended by a large, boat-shaped bract. The colour is yellow, veined and tinged with bright green, and margined with white. Peru, 1876. Syn. *S. reticulatum*. (L., t. 10.)

S. caricinum (*Rchb. f.*).—In this sedge-like species the leaves spring in tufts from stout, creeping rhizomes; they are green, somewhat rigid, and about 1ft. long. Scape erect, bearing four to six flowers, which are medium-sized, pale green, with white margins to the sepals and petals; pouch bright green, with a row

of black dots on the inner margin. This species might be grown in a moist greenhouse. Peru, 1863. (B. M., t. 5466.)

S. caudatum (*Rchb. f.*).—One of the most graceful and attractive of Orchids, and one that has always excited much interest

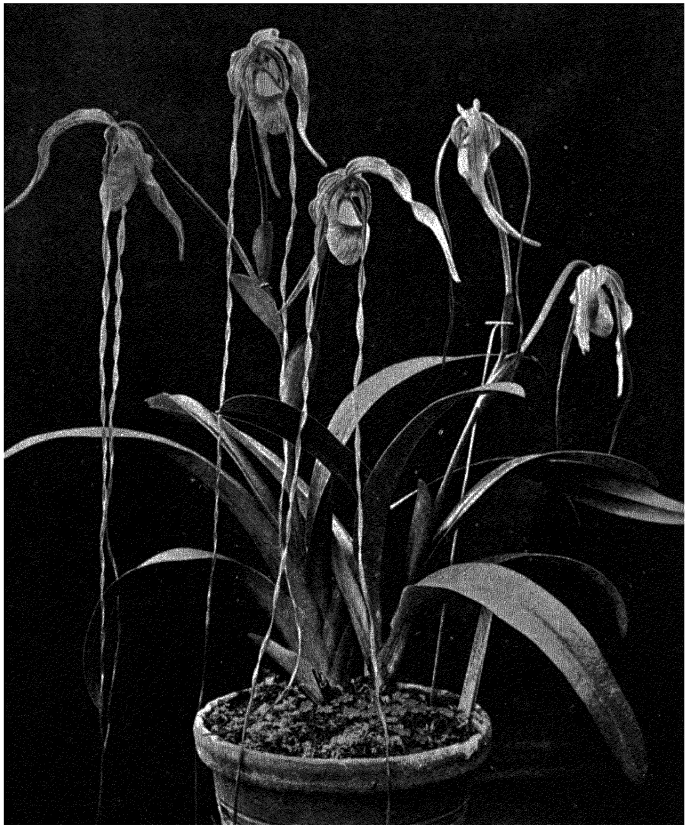


FIG. 156. SELENIPEDIUM CAUDATUM WALLISII (much reduced).

when in flower. It has rather stiff, bright green, strap-shaped, curved leaves, 1ft. long, and erect scapes about 1½ft. high, springing from the centre of the growths. Strong plants have produced four flowers on each scape, but the usual number is

Selenipedium.

three. Both dorsal and lower sepals are narrow, 6in. long, and curved forward; the petals are narrow and ribbon-like, pendent, ultimately becoming as much as 2ft. or even more long; they are yellow at the base, the rest being brown and purple; pouch 2in. long, reddish-brown, yellow at the base, with red spots. The flowers are developed in April or May, and remain fresh for about a month. Ecuador, 1847. For its cultivation this plant requires either warm greenhouse or stove treatment, some growers preferring the one, some the other; it thrives under both methods. It requires plenty of moisture, and the soil about the roots should be kept sweet and open, the slightest sourness causing the roots to rot. (W. S. O., ii., t. 1.)

Var. *Lindeni* is remarkable for the form of its lip, which, instead of being pouch-shaped, is long and ribbon-like, resembling the petals; it is also paler in colour. This is supposed to be an abnormal or monster form of the type. Syn. *Uropedium Lindeni*. (R. G., x, t. 315.)

Var. *Wallisii* is another most desirable addition. The sepals are pale green, striped and slightly spotted with a darker green; petals white, veined with green, passing into very narrow tails, tinted with pale brown at the apex; the lip is large, white, spotted and veined with crimson; the mouth is margined with yellow. Ecuador. (Fig. 156.)

S. kaieteurum (*N. E. Br.*).—A synonym of *S. Lindleyanum*.

S. Lindleyanum (*Rchb. f.*).—A most robust-growing and desirable plant. Flowers, sepals and petals pale green, with reddish-brown nerves on the outside, pubescent, with crisped margins, the upper one hooded at the apex; petals pale green, with brownish-crimson veins, 2½in. long, falcately linear, the margins recurved and ciliated; lip light olive-green, with brownish-crimson veins, and densely dotted on the side lobes; scape many-flowered, pubescent. Leaves coriaceous, bright dark green. Kaieteur Falls, British Guiana, 1885. Syn. *S. kaieteurum*. (R. X. O., t. 278.)

S. longifolium (*Rchb. f.*).—This free-growing and stately plant has long strap-shaped, dark green, shining foliage, forming a large tuft. Scape erect, from 2ft. to 3ft. high, six- to ten-flowered, the flowers opening in slow succession, so that the plant is in blossom for about half the year; dorsal sepal pointed, thin, wavy, green, with faint reddish streaks; lower sepal large, boat-shaped, pale green; petals narrow, 4in. to 6in. long, twisted, green, margined with rose and white; pouch large, wide at the mouth, green and purple-brown. It is an easily-grown plant, but poor

in floral colour. There seems to be very little difference between it and *S. Roezlii.* Native of Central America; introduced in 1870. (B. M., t. 5970.)

Var. *Hincksianum* has larger and brighter-coloured flowers than in the type.

S. reticulatum (*Rchb. f.*).—A synonym of *S. Boissierianum.*

S. Schlimii (*Rchb. f.*).—This distinct and pretty species is suitable for cultivation in a greenhouse. The leaves are 6in. to 8in. long, thin and narrow, and light green. The scape is erect and branched, bearing six or more flowers, which are 2in. across; the sepals and petals are snow-white, tinged with green towards the ends, and mottled with purplish-rose; the pouch is round, very much contracted at the mouth, white, with a blotch of deep rose in front. This plant should be grown in a mixture of peat, sphagnum, and sand, and be well drained; it should be kept moderately cool, and at all seasons of the year freely supplied with water, but during the growing season a copious supply must be given. It blossoms at various times of the year. It is interesting as being one of the progenitors of the many fine hybrids represented by *S. Sedeni.* It inhabits swampy places in Colombia, at an elevation of 4000ft. above the sea, where it was



FIG. 157. INFLORESCENCE AND LEAF OF SELENIPEDIUM SCHLIMII (much reduced).

Selenipedium.

discovered by M. Schlim, a collector employed by M. Linden, about 1866. (Fig. 157; B. M., t. 5614.)

S. Wallisii (*Rchb. f.*).—A variety of *S. caudatum.*



FIG. 158. FLOWERS OF SELENIPEDIUM DOMINIANUM (½ nat. size).

GARDEN HYBRIDS.

Ainsworthii *Roezlii* and *Sedenii* (Ainsworth).
albanensis *Schlimii* and *Sedenii* (Sander).

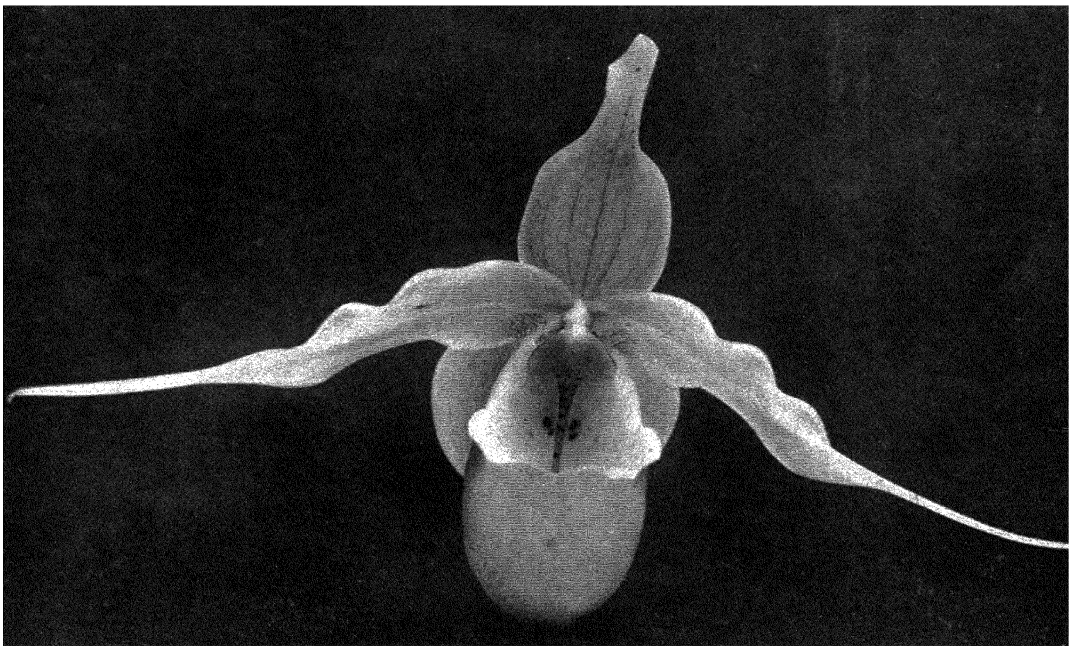
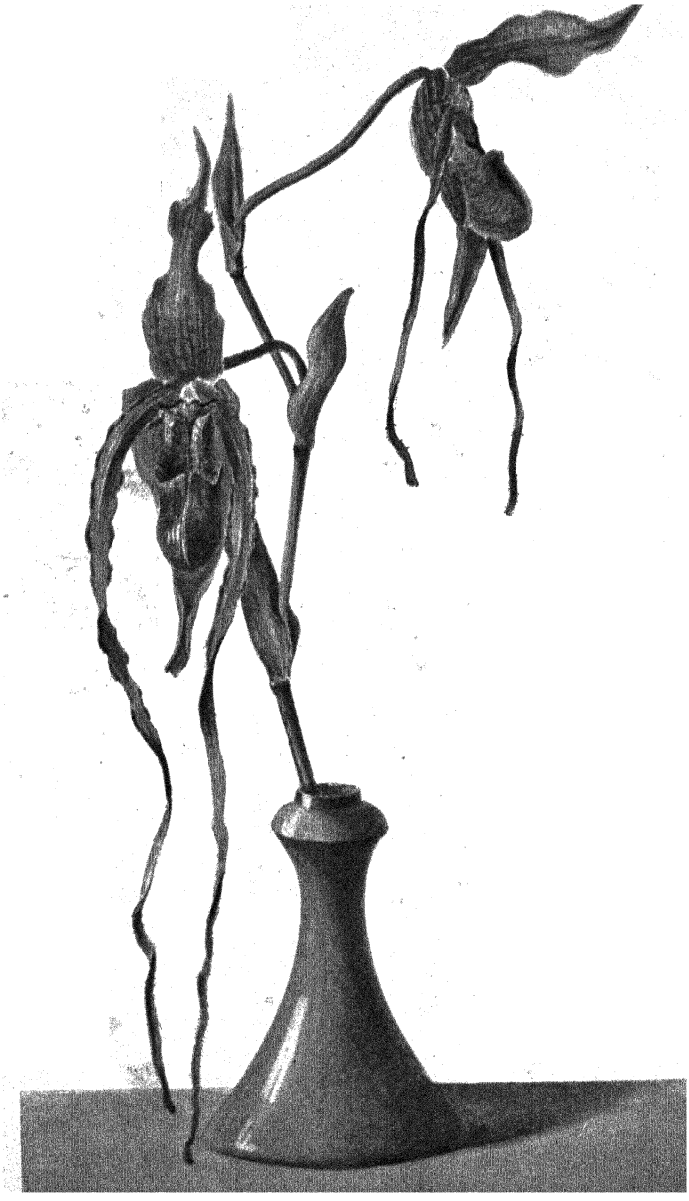


FIG. 159. FLOWER OF SELENIPEDIUM LEUCORRHODUM
(nat. size).



SELENIPEDIUM NITIDISSIMUM.

Selenipedium.

albo-purpureum *Schlimii* and *Dominianum* (Veitch).
Baconis..... *Chlorops* and *Schlimii* (Sander).
Brownii *magnifolium* and *leucorrhodum* (Pitcher).
Brysa *Boissierianum* and *Sedenii candidulum* (Veitch).
calurum *longifolium* and *Sedenii* (Veitch).
cardinale *Sedenii* and *Schlimii albiflorum* (Veitch).
Cardinal Schlim..... *cardinale* and *Schlimii* (R. I. Measures).
Chlorops *longifolium Hartwegii* and *caricinum* (Sander).
Cleola *Boissierianum* and *Schlimii albiflora* (Veitch).
Clonius..... *caudatum Lindenii* and *conchiferum* (Veitch).
compactum *calurum* and *Sedenii candidulum* (Ingram).
conchiferum..... *caricinum* and *longifolium* (Bowring).
Coppianianum..... *Sedenii* and *conchiferum* (Sander).
Cumea *longifolium Hartwegii* and *Sedenii* (Graves).
Dominianum (Fig. 158) *caricinum* and *caudatum* (Veitch).
Dominianum - albiflorum *caricinum* and *caudatum Wallisii* (Veitch).
Edithæ..... *conchiferum* and *Schlimii albiflorum* (Sander).
Elsteadianum *conchiferum* and *grande* (Ingram).
Empress *cardinale* and *Schlimii albiflorum* (Ball).
Finetianum *cardinale* and *caudatum* (Finet).
grande *Roezlii* and *caudatum* (Veitch).
Hardyanum..... Syn. *macrochilum*.
Lemoinierii *calurum* and *Sedenii porphyreum* (Sander).
leucorrhodum (Fig. 159) *Roezlii* and *Schlimii* (Veitch).
L'unique *Lindleyanum* and *Schlimii* (Ingram).
macrochilum *Roezlii* and *caudatum Lindenii* (Veitch).
macrochilum giganteum *grande* and *caudatum Lindenii* (Veitch).
Miss H. A. Roebling.. *caudatum* and *leucorrhodum* (Roebling).
Mrs. W. A. Roebling.. *Sedenii candidulum* and *caudatum* (Roebling).
nitidissimum *caudatum* and *conchiferum* (Veitch).
Perseus..... *Sedenii porphyreum* and *Lindleyanum* (Veitch).
Phædra..... *Lindleyanum* and *Sedenii candidulum* (Veitch).
Psyche..... Syn. *leucorrhodum*.
pulchellum *grande* and *Sedenii candidulum* (Vanner).
robustus Syn. *calurum*.
Rosy Gem *cardinale* and *Schlimii* (Ingram).
rubicundum..... *Schlimii* and *Sedenii* (R. I. Measures).
Saundersianum *caudatum* and *Schlimii* (Bull).
Schræderæ *Sedenii* and *caudatum* (Veitch).
Sedenii..... *Schlimii* and *longifolium* (Veitch).
Sedenii candidulum .. *Schlimii albiflorum* and *longifolium* (Veitch).
stenophyllum *Schlimii* and *caricinum* (Veitch).
tenellum *magnifolium* and *Schlimii albiflorum* (Pitcher).
Thersites *Sedenii* and *Lindleyanum* (Veitch).
sitanum *longifolium Hincksianum* and *Lindleyanum* (Sander).
unique Syn. *L'unique*.
Uranus..... *Lindleyanum* and *grande* (Sander).
Weidlichianum *longifolium Hartwegii* and *Schlimii* (Cookson).

SERAPHYTA.

A monotypic genus of epiphytal Orchids belonging to the tribe *Epidendreæ*. The name given by Fischer and

Seraphyta.

Meyer is from *ser*, a silkworm, and *phyton*, a plant; in allusion to some fancied resemblance between the flower and the silkworm. The species *S. multiflora* (Syn. *S. diffusa*), a native of the West Indies, requires intermediate-house treatment. The plant is also sometimes found in cultivation under the name of *Epidendrum diffusum*. It is of little horticultural interest.

SERAPIAS.

Linnæus founded this genus of hardy terrestrial Orchids belonging to the tribe *Ophrydeæ*. It contains three or four species, natives of the Mediterranean region. The generic name, the old Greek one given by Dioscorides to one of the Orchids, is derived from the Egyptian deity Serapis. Flowers often rather large, few in a spike; sepals erect, connivent or coherent in a tube; petals sometimes smaller, sometimes scarcely shorter, but much narrowed; lip three-lobed, the lateral lobes erect, the middle one tongue-shaped and pendulous. Leaves narrow. Tubers undivided. *S. cordigera* (*L.*) and *S. lingua* (*L.*) are the two species usually found in cultivation.

SIEVEKINGIA.

Four species of stove Orchids, belonging to the tribe *Vandeæ*, are known under the above commemorative name, bestowed by the younger Reichenbach. Only one species has as yet been introduced; this requires similar culture to *Acineta*.

S. Reichenbachiana (*Rchb. f.*).—Flowers about six, in a pendulous corymb, each about 2in. across; sepals pale straw-colour, concave; petals narrower, and, as well as the lip, fringed with deep yellow hairs; lip blotched with red; peduncle 2in. long. Leaves solitary, elliptic-lanceolate, plicate, prominently ribbed; petioles speckled with red. Pseudo-bulbs long, clustered, blotched with red. Ecuador, 1890. (B. M., 7576.)

SIGMATOSTALIX.

Warm intermediate-house Orchids belonging to the tribe *Vandeæ*. The name, given by the younger Reichenbach, is from *sigma*, *sigmatos*, S-shaped, and *stalix*, a stake.

Sigmatostalix.

Flowers mediocre, or rather small, shortly pedicellate, scattered, racemose; claw of the lip long, two-keeled; peduncles axillary under the one-leaved pseudo-bulbs. Natives of tropical America. The species (*S. radicans*) (*Rchb. f.*) is rarely seen in cultivation outside botanic collections.

SOBRALIA.

Owing to the short duration of the individual flowers, which usually fade after being open one day, this genus, of the tribe *Neottieæ*, has not hitherto been held in much favour. The name given by Ruiz and Pavon is in honour of Don F. M. Sobral, a Spanish botanist. Of the twenty-five to thirty species known to botanists, there are but a few that have enjoyed extensive cultivation.

The habit of Sobralias is very characteristic; they have no pseudo-bulbs, and the stems are slender and reed-like, bearing plaited and slightly coriaceous leaves. *S. dichotoma*—a Peruvian species not known in cultivation—is said to have stems 12ft. to 20ft. high, forming dense, impenetrable thickets. In the species described they rarely exceed 6ft. in height. The flowers are produced singly from the top of the stem, which continues during the flowering season to produce a close succession of blooms, thus making amends for their transient character. Each flower is large and spreading, varying in colour from the richest purple to yellow and the purest white; the sepals and petals are alike in colour, and nearly so in size and shape; the sides of the lip fold over the column, whilst the front portion is spreading, and undulated or fringed. All the species are natives of tropical America.

Culture.—The subjoined species, when in good health, are most successfully grown in the intermediate-house; but newly-imported plants should be placed in a stove for the first year or so until they have become established. Growing freely, and being somewhat gross feeders, they should be given pots large enough to allow the roots free play. The compost should consist of fibrous peat, mixed with good fibrous loam, a little leaf-soil, and sufficient rough sand to keep the compost in a porous condition.

Sobralia.

As Sobralias require almost unlimited supplies of water during growth, careful drainage is important, a depth of about one-fifth of the pot being necessary. During winter less water is required, but the soil should always be moist. When the growths become crowded, it is advisable to remove a proportion of those that have flowered, thus giving light and freedom to the young ones that are pushing.

S. leucoxantha (*Rchb. f.*).—Though as yet rare in gardens, this is a superb species. Its slender stems are 1½ft. to 2ft. high, and produce the blooms at intervals during the summer months. The leaves are plaited, cuneate-oblong, and pointed. The sepals are nearly 3in. long by 1in. broad, pure white, the tips recurved; the petals are also pure white, scarcely so firm in texture as the sepals. The outside of the lip is pure white, as is also the prettily-frilled edge on the inside, but the colour deepens gradually into a rich golden-yellow in the throat; the sides are incurved over the column, forming a tube 2in. in length, the apex expanding. Costa Rica, 1885. (B. M., t. 7058).

S. Lowii (*Rolfe*).—Stems of a dark purple shade, 1ft. to 1½ft. high. Flowers medium size, bright purple. This species is allied to *S. sessilis*. Colombia, 1890.

S. Lucasiana (*Hort.*).—Stems 3ft. to 5ft. high. Flowers large; sepals and petals white, faintly tinged with rose; lip rosy-purple, with a yellow blotch at the base. Tropical America, 1892. This is regarded by some as but a variety of *S. macrantha*.

S. macrantha (*Lindl.*).—This is the best known, and perhaps the most useful, of Sobralias. The slender, reed-like stems are 4ft. to 7ft. high, the leaves with which the upper part is furnished being deep green, plaited, ovate, and pointed. The flowers are large and showy, frequently measuring 6in. to 7in. across; after the first day they commence to fade. The sepals are oblong, the petals being broader, and crisped at the margin. The base of the lip closes over the column; the front portion is broad, spreading, and wavy round the edge. The whole flower is of a rich purple, with the exception of a spot of pale yellow on the base of the lip. Well-established specimens of this species are rarely out of flower from May to July. It thrives in the coolest part of the intermediate-house. During the summer, too much water can scarcely be given if the drainage be perfect, and when growth is most active occasional applications of weak manure-water are beneficial. Guatemala and Mexico, 1842. (B. M., t. 4446.)

Sobralia.

Var. *Kienastiana* has flowers "of the most exquisite purity, surpassing all shades of white I have seen" (Reichenbach). There is a small, sulphur-coloured mark near the base of the lip.

Var. *nana* is much valued, being of dwarf habit, with deep purple and crimson flowers, quite as large as those of the type.

Var. *pallida* has the sepals and petals soft rose, and the lip almost white.

S. sessilis (*Lindl.*).—A rare and very beautiful species, dwarfer in habit than the majority of Sobralias. Its reed-like stems are from 1ft. to 2ft. in height, and the leaves are broadly lance-shaped, tapering to a long, narrow point, and somewhat hard in texture. One flower only is open on a stem at once, and each lasts but a single day; the stems, however, continue to push forth a succession of flowers, so that during the flowering season a fairly large plant is not long without bloom. The spreading, oblong sepals and petals are pure white, the latter being slightly larger and broader. The lip is of a yellowish colour, beautifully tinged with rose-pink; the sides curl upwards, and meet above the column; the front lobe is expanded, and prettily undulated at the margin. Each flower is 2in. across. British Guiana; introduced in 1840. It flowers from October to January. (B. M., t. 7376.)

S. xantholeuca (*Rchb. f.*).—In general appearance this lovely species differs but little from *S. macrantha*, except that, so far as can at present be judged, it does not grow so tall. The sepals and petals are narrowly oblong, and of a pale lemon-yellow, the large frilled lip being of a deeper shade. This species was introduced from Central America about 1881, and it still remains extremely rare. It appears to possess the free-flowering character of *S. sessilis*. (B. M., t. 7332.)

GARDEN HYBRIDS.

Amesiana *xantholeuca* and *Wilsonii* (Sander).
dellense *leucoxantha* and *Lowii*.
Veitchii *macrantha* and *xantholeuca* (Veitch).

SOPHRO-CATTLEYA.

Bigeneric hybrids, derived from the intercrossing of *Sophronitis* and *Cattleya*. They require intermediate-house culture.

Batemaniana *S. grandiflora* and *C. intermedia* (Veitch).
Calypso *S. grandiflora* and *C. Loddigesii* (Veitch).

Sophro-Cattleya.

Chamberlainiana	*C. Harrisonæ* and *S. grandiflora* (Chamberlain).
Cleopatra	*S. grandiflora* and *C. guttata Leopoldii* (Chamberlain).
eximia	*S. grandiflora* and *C. Boweringiana* (Veitch).
George Hardy.....	*S. grandiflora* and *C. Aclandiæ* (Hardy).
Nydia (Fig. 160)	*S. grandiflora* and *C. calummata* (Charlesworth).
Queen Empress	*C. Mossiæ* and *S. grandiflora* (Veitch).

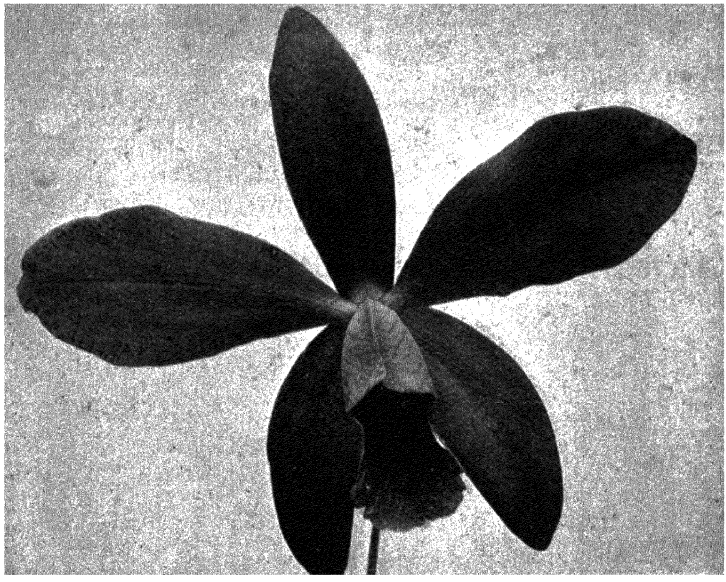


FIG. 160. FLOWER OF SOPHRO-CATTLEYA NYDIA
(nat. size).

SOPHRO-LÆLIA.*

Bigeneric hybrids produced from *Sophronitis* and *Lælia*. They require intermediate-house culture.

Gratrixia.....	*L. tenebrosa* and *S. grandiflora* (Charlesworth)
Hardyana	*S. grandiflora* and *L. pumila* (Hardy).
læta (Fig. 161)	*S. grandiflora* and *L. Dayana* (Veitch).
Marriottiana	*S. grandiflora* and *L. flava* (Marriott).
Orpetiana.....	Syn. *Hardyana* (Orpet).
Psyche	*L. cinnabarina* and *S. grandiflora* (Charlesworth).
Valda	*S. grandiflora* and *L. harpophylla* (Veitch).

SOPHRO-LÆLIO-CATTLEYA.

Hybrids obtained by intercrossing the species of *Sophronitis* with the bigeneric hybrid *Lælio-Cattleya.* They require intermediate-house culture.

Eros Syn. *Veitchii* (Charlesworth).
Veitchii *S. grandiflora* and *L-C. elegans* (Veitch).

SOPHRONITIS.

Dr. Lindley founded this genus, of the tribe *Epidendreæ*, upon *S. cernua*, which was introduced from Rio Janeiro

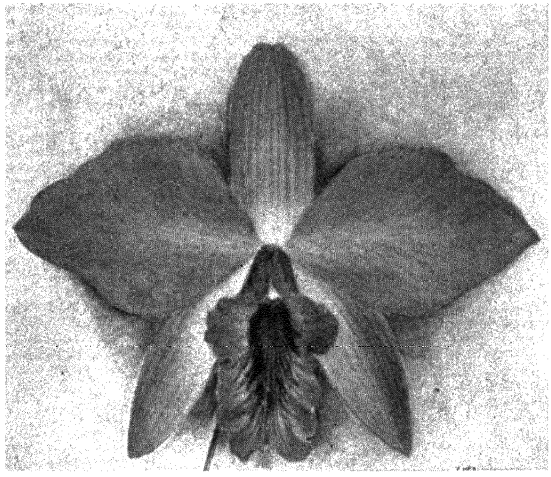


FIG. 161. SOPHRO-LÆLIA LÆTA
(nat. size).

in 1826. The small size and neat habit of that species suggested the generic name, *sophron*, a Greek word, signifying modest or unassuming. Although applicable to the first discovered species, the title seems somewhat out of place when applied to a plant so brilliant and attractive as *S. grandiflora.* Only three species are known, all of which are natives of Brazil. They are small, compact plants, the pseudo-bulbs clustered on the rhizome, and each bearing a solitary leaf. The scape springs from

Sophronitis.

the base of the matured pseudo-bulb, and is usually one-flowered: well-managed plants flower profusely. The two lower sepals are united at the base, and the lip is erect and three-lobed; the column is short and thick, winged; and there are eight pollinia, in two cells. The genus is very closely related to *Cattleya*.

Culture.—These plants commend themselves especially to those who possess only limited room for the cultivation

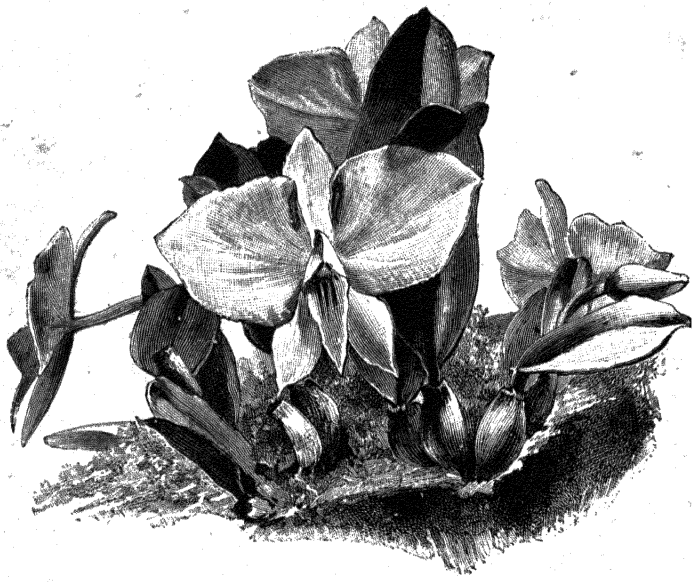


FIG. 162. SOPHRONITIS GRANDIFLORA
(⅓ nat. size).

of tender subjects. In a cool Orchid-house their culture is of the simplest possible kind, as they only require to be planted in small, shallow pans, or fastened upon blocks of wood, with a little sphagnum and peat-fibre for the roots to creep through, and to be kept moderately moist. They do not require to be dried off or to be subjected to extremes of any kind. When making new growth, they should be kept constantly moist at the roots. The flowering season is from November to March.

Sophronitis.

S. cernua (*Lindl.*).—In its habit of growth this species is very compact. The pseudo-bulbs are ½in. long, and bear each a single, somewhat broadly-ovate, dark green leaf, about 1in. long. Four to eight flowers are produced on a short peduncle; they are individually smaller than those of *S. grandiflora*, and they are of a rich, bright scarlet, with a yellow lip. They are produced in mid-winter, lasting in full perfection for a considerable period. Introduced in 1826. Syn. *S. pterocarpa*. (B. M., t. 3677.)

S. grandiflora (*Lindl.*).—During the whole of the winter months, this, the finest of the three species, produces its brilliantly-coloured flowers. The pseudo-bulb is terete, or sometimes egg-shaped, 1in. or more long. The leaves are oblong, 2in. to 3in. long, leathery, deep green, the whole plant seldom exceeding 3in. or 4in. in height. The flowers are produced singly from the apex of the pseudo-bulbs, and measure from 1½in. to 4in. across; they are thick in texture, with broad, brilliant scarlet sepals and petals; the lip is narrow, folding at the sides, orange-yellow, streaked with scarlet. When cut and placed in water, the flowers keep fresh for a week or more; whilst if left upon the plants and kept from drip or sprinklings from the syringe, they continue in full beauty for many weeks. This species was introduced, in 1837, from the Organ Mountains, where it grows upon trees at an elevation where white frost occurs in the mornings. (Fig. 162; B. M., t. 3709.)

Var. *purpurea* has pseudo-bulbs and leaves shorter than in the type, and flowers of a bright carmine-purple.

S. pterocarpa (*Lindl.*).—A synonym of *S. cernua*.

S. violacea (*Lindl.*).—One of the smallest of garden Orchids. It is a perfect gem in its way, possessing a beauty peculiarly its own. The pseudo-bulbs are 1in. long, pointed at both ends, and fluted. The leaves are narrow, 2in. long, and the peduncles are usually one-flowered. Flowers 1in. across, violet-magenta, with a paler eye. They are produced in winter. The plant was introduced from the Organ Mountains in 1837. (B. M., t. 6880.)

SPATHOGLOTTIS.

This genus, of the tribe *Epidendreæ*, is distributed over a large area, stretching from Northern India and China, through the East Indies and the Malayan Archipelago, as far as the New Caledonian Islands. Over a dozen species have been introduced, and it is probable that many kinds have yet to be discovered. The name given

Spathoglottis.

by Blume is from *spathe*, a spathe, and *glottis*, a tongue; in allusion to the form of the lip. The pseudo-bulbs are usually, but not always, underground; the leaves are long and narrow, several species having only one or two on each growth; the flower-spikes are erect, and bear the flowers towards the top; the sepals and petals are spreading, and the lip is distinctly three-lobed.

Culture.—Owing to the different latitudes and elevations at which the various species of *Spathoglottis* are found, their treatment varies somewhat as to temperature. *S. Fortunei* we find to thrive in a warm or an intermediate-house, whilst *S. aurea* and *S. Vieillardii* require a strong, moist heat when growing. In other respects, however, the treatment is similar. Pots or broad pans should be used, and a compost of fibrous loam and peat, with a little leaf-soil and fine potsherds added, is most suitable. Being truly terrestrial Orchids, the surface of the soil should be slightly below the rim of the pot. The plants enjoy a good supply of water when active, but when growth is completed this should gradually cease until scarcely any is given.

S. Augustorum (*Rchb. f.*).—A synonym of *S. Vieillardii*.

S. aurea (*Lindl.*).—Leaves plaited, narrowly lance-shaped, pointed, 3ft. long by 1½in. broad. The flowers are about 3in. across, with oval-oblong, bright yellow sepals and petals, the former being marked with a few brown lines and dots near the base. The lip is small, yellow, sparsely spotted with purple-brown; the side lobes are erect, rounded, and the central lobe, which is very variable in shape, may be (according to Reichenbach) "narrow and acute, or broad, simply retuse, or three-toothed"; it has a triangular secondary lobe on each side near the base. This fine species is a native of Mount Ophir; it was introduced originally by Messrs. Veitch and Sons in 1849, and again in 1886 by Messrs. F. Sander and Co. Syn. *S. Kimballiana*. (B. M., t. 7443.)

S. Fortunei (*Lindl.*).—A pretty-flowered, deciduous species, with somewhat scanty foliage, found on the granite mountains of Hong Kong. The pseudo-bulbs are flat and tuber-like. The pale green leaves are 1ft. long, narrowly lance-shaped, thin, and plaited. The flower-scapes are slightly pubescent, erect, 1ft. high, bearing six to eight flowers; sepals and the slightly broader petals ovate, bright yellow; lip conspicuously three-lobed, the side lobes

Spathoglottis.

erect, with chocolate-coloured tips, the front lobe wedge-shaped and notched at the apex. The flowers measure 1½in. across. This species should be grown in pans of sandy loam and leaf-soil, and may remain in the cool-house at all seasons: a little extra heat, however, is beneficial at the commencement of the growing season. Fairly abundant supplies of water are needed during growth, but after the foliage has disappeared the soil should be kept quite dry. The flowers appear in September and October. Introduced in 1845. (B. R., 1845, t. 19.)

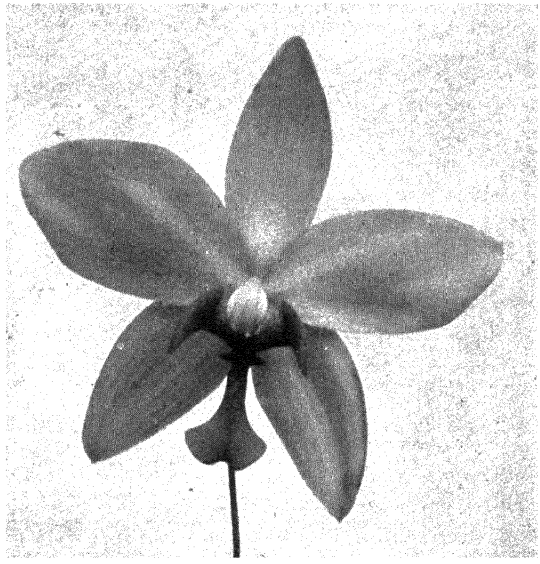


FIG. 163. FLOWER OF SPATHOGLOTTIS AUREO-VIEILLARDII (WIGAN'S VAR.)

(nat. size).

S. Kimballiana (*Sander*).—A synonym of *S. aurea.*

S. Vieillardii (*Rchb. f.*).—Of the species introduced this is the largest and showiest. The handsome leaves are 2ft. long by 2in. to 3in. broad, acuminate, and plaited. The scape springs from the base of the pseudo-bulb, and attains a height of 2ft. to 3ft. Several scores of flowers are produced on the spike, but not more than ten or a dozen are open simultaneously; the flowering season lasts for three months. The blooms are 2in. in diameter;

Spathoglottis.

the broad, ovate sepals and petals are white, or of a pale lilac. The lip is three-lobed; the side lobes are small, erect, orange-brown, with two large, orange-coloured protuberances on the disk between them; the projecting front lobe is deep lilac, broadly obcordate, united to the body of the lip by a long, slender stalk. The species is a native of Polynesia, and was introduced in 1886. It requires moist stove treatment when growing, with a decided period of rest afterwards. It flowers from September onwards. Syn. *S. Augustorum.* (B. M., t. 7013.)

GARDEN HYBRIDS.

aureo-Vieillardii *aurea* (*Kimballiana*) and *Vieillardii* (Veitch).
aureo-Vieillardii (Wigan's var.) (Fig. 163) *aurea* (*Kimballiana*) and *Vieillardii* (Wigan).

SPIRANTHES.

Widely distributed terrestrial Orchids belonging to the tribe *Neottieæ.* The name, given by the younger Reichenbach, is from *speiros*, a spiral, and *anthos* a flower; in allusion to the spiral inflorescence. The genus, popularly known as Lady's Tresses, now includes *Stenorrhynchus.* The flowers are usually small, or of only medium size, carried on erect, sometimes bracteate scapes. They are of botanic rather than horticultural interest, and require temperatures according to the country from which they have been introduced, and a compost of fibrous loam, peat, and leaf-soil, with sufficient sand to keep the compost in a porous state. Liberal treatment is necessary while the plants are in active growth, followed by a prolonged season of rest, during which little or no moisture is required.

STANHOPEA.

About twenty species, most of which have been in cultivation at some time or other, are included in this genus. They belong to the tribe *Vandeæ.* The name given by Frost is in honour of Earl Stanhope. The species are characterised by fleshy, egg-shaped pseudo-bulbs, clustered on a very short rhizome, that become furrowed or wrinkled with age. Each pseudo-bulb is surrounded by a layer of loose, fibrous, brown sheaths, and is surmounted by a

Stanhopea.

single, stalked, leathery, plaited, stout, green leaf. The scape springs from the base of the matured pseudo-bulb, and is invariably pendulous; it varies in length and in the number of its flowers, and is clothed with conspicuous, boat-shaped bracts, which are largest about the flower-stalks. The flowers are large, often bright-coloured and spotted; the sepals are large, broad, and spreading; the petals are similar but narrower, and usually thinner in texture. The lip is large, fleshy or wax-like in texture, and very remarkable in structure; the basal portion (hypochil) is globose or boat-shaped, and hollow; the intermediate portion (mesochil) varies in size and form, and nearly always terminates in a pair of stiff, horn-like lobes; the apex or front lobe (epichil) is more like what is termed the lip in Orchids generally. The column is large and conspicuous, and is usually flattened or winged. The species described are found only in South and Central America and Mexico. The genus is related to *Acineta*, *Catasetum*, and *Coryanthes*, and, like them, it is remarkable, even among Orchids, for the highly-specialised character of the labellum of the flower. If we are struck by the singular modification of form in that part of the flower that is really a petal though called a lip, in such genera as *Cattleya*, *Odontoglossum*, and *Phalænopsis*, how much more may one wonder at Nature's provision to insure cross-fertilisation in the flowers of the genera above named and in Stanhopea! It would be impossible to find anything more remarkable in the whole order of Orchids than the lip of *S. eburnea* or that of *S. platyceras*.

The flowers are developed irregularly, according to the treatment and growth of the plant; as a rule, however, the species bloom in autumn. The only drawback Stanhopeas have, as garden plants, is the early fading of their flowers, which rarely last a week, even under the most favourable conditions. But they are wonderful objects when at their best, and they are almost overpoweringly fragrant; whilst the plants are so easy to manage, and so rarely fail to bloom, that they well deserve to be ranked with first-class garden Orchids.

Culture.—All the species should be grown in a stove temperature. They are best planted in teak baskets sufficiently large to afford space for a good layer of

Stanhopea.

compost, consisting of one part peat-fibre and two parts sphagnum, with a few pieces of charcoal. The bottom of the basket must, of course, be open, and a few long, narrow pieces of charcoal should be laid, about 1in. apart, across the bottom. This is sufficient to keep the compost from washing away, whilst it permits the flower-spikes to come through the bottom of the basket. Some cultivators use nothing but sphagnum for Stanhopeas, and grow them well; but the addition of a little good peat-fibre and charcoal is beneficial, as it keeps the moss fresh and open. During summer, when growth is most active, these plants require an abundance of moisture both at the root and on the leaves. In hot weather they should be well watered daily. In winter they require less moisture; in fact, if suspended in a house where the atmosphere is kept moist, they do not require any attention at that season as regards water. Naturally they grow upon trees, and we sometimes see newly-imported plants attached to pieces of branches that they have enveloped with a thick layer of roots; but it is not advisable to attempt to grow Stanhopeas on blocks of wood. Whilst in flower the plants should be placed in a cool or greenhouse temperature.

The species here described are the best and the easiest to procure.

S. Amesiana (*Hort.*).—A synonym of *S. Lowii.*

S. aurea (*Lodd.*).—A synonym of *S. Wardii.*

S. bucephalus (*Lindl.*).—One of the best known of all Stanhopeas, and a handsome-flowered, easily-grown plant. It belongs to the same group as *S. oculata* and *S. Wardii*, differing from them chiefly in the form of the lip. Its pseudo-bulbs are dark green, ridged and wrinkled when old, and the leathery, dark green leaves have petioles 3in. long and a blade 9in. by 4in. The pendulous spike is about 8in. long, four- to six-flowered. Each flower is 4in. across. The sepals and petals are reflexed, the former broad, the latter wavy, their colour rich tawny-yellow, marked with large crimson spots. The column is 2in. long, green and white, spotted with purple. The lip has a curved, boat-shaped cavity, two projecting, curved horns, and a broad, fleshy mid-lobe, the apex of which is claw-like; the colour is similar to that of the sepals and petals. The fragrance of the flowers is overpowering when in a small house. This species

Stanhopea.

was introduced from Peru in 1842; it is also a native of Mexico. It flowers in August. Syn. *S. Jenischiana.* (B. M., t. 5278.)

S. devoniensis (*Lindl.*).—A handsome species, the flowers being large, leopard-spotted, and of deep, soft colours. Pseudo-bulbs fig-shaped, furrowed. Leaves plaited, stout, 9in. to 12in. long. The pendulous scape bears two or three flowers, and is clothed at the base with greenish, scale-like bracts. Each flower is 5in. across. The broad sepals are spreading, and coloured orange, with broad, reddish-brown blotches. The petals are narrow, wavy, and coloured like the sepals. The lip is very fleshy; the lower half is nearly globose, with thick, dilated margins extended on each side into a pair of long, incurved, pointed horns; the apical portion is ovate, channelled, and three-toothed at the tip. The column is large, thick, plano-convex, and not winged. The colour of the column and lip is white, stained with purple. This species is closely related to *S. tigrina.* Its name commemorates the late Duke of Devonshire, in whose famous collection of Orchids at Chatsworth this and other species of *Stanhopea* were first cultivated with success by Sir Joseph Paxton. The present species flowered there in 1837. It is a native of Peru. Syn. *S. maculosa.* (L. S. O., t. 1.)

S. eburnea (*Lindl.*).—A beautiful-flowered species in its best form, and one which is easily distinguished from the rest of the cultivated Stanhopeas by its white, wavy-looking flowers and the peculiar formation of the lip. The pseudo-bulbs are conical, 1½in. long. The leaves are leathery, 8in. to 12in. long by about 4in. wide. The scapes are pendulous, with small bracts, and they bear two or three flowers, which are 5in. across. The sepals are broad, the petals narrow, both being reflexed and shining, waxy white. The lip is 3in. long, solid and fleshy except at the base, where there is a short cavity with a pair of hook-like horns over the mouth; the apex of the lip is heart-shaped, and, except a few blotches of purple on the upper part of the lip, it is white, like the sepals; the column is 3in. long, narrow, conspicuously winged near the top. This species is common in British Guiana and adjacent countries. Introduced from Trinidad about 1824. Syn. *S. grandiflora.* (B. M., t. 3359.)

S. ecornuta (*Lindl.*).—Although rare in gardens, this species deserves mention here because of the exceptional form of its flowers. The pseudo-bulbs and leaves are large, deep green, and very like those of *S. eburnea.* The scape is short, enveloped in short, green, boat-shaped, overlapping bracts, and is two-flowered. The sepals, which all point upwards, are ear-like, 2in. long, half as wide, concave, rather fleshy, and creamy-white.

Stanhopea.

The petals are similar to the sepals, but smaller. The lip is so remakable in form that the species was at first supposed to be a monstrosity of some kind, and subsequently a new genus, *Stanhopeastrum*, was founded upon it by Reichenbach. The terminal lobe and horns, characteristic of the genus, are in this species entirely absent, the lip being simply a fleshy, tuberculated sac, about 1½in. long and 1in. wide, and the narrow aperture is partly covered by the short, fleshy column. The colour of both column and lip is bright yellow, deepening to dark orange at the base. The species was introduced from Central America in 1846. (B. M., t. 4885.)

S. florida (*Rchb. f.*).—Introduced about twenty-three years ago, this species first flowered with Sir Trevor Lawrence, who procured it at an auction sale. It belongs to the section represented by *S. insignis*, and is a native of Mexico. The flowers are produced on a stout, pendulous scape, strong plants bearing as many as seven on a single scape, each being 5in. across. The sepals are 3in. by 1½in., white, with small purple dots. The petals are smaller, and coloured like the sepals. The lip has a thick, fleshy, sac-like base, and is whitish, thickly spotted with purple, having a large, eye-like blotch on each side at the base. (G. C., 1881, p. 565, fig. 108.)

S. grandiflora (*Lindl.*).—A synonym of *S. ecornuta.*

S. insignis (*Hook.*).—A very handsome species, related to *S. bucephalus.* Pseudo-bulb ovate and ribbed; leaf stout, leathery, with a short petiole and a blade 1ft. long by 4in. wide. Scape about 6in. long, covered with dark brown sheaths, two- to four-flowered. Flowers 5in. across; sepals broad, concave, spreading, dull yellow, spotted with purple; petals narrow, wavy, thin, coloured like the sepals; base of the lip short and globose, thick and wax-like, 1in. deep, with a broad margin, the colour a dull white, with numerous spots of bright purple, wholly purple inside the cavity; horns 1in. long, curved upwards and forwards; mid-lobe heart-shaped, channelled, and narrowed to a point. This species was the first to flower under cultivation, and the genus *Stanhopea* was founded upon it by Sir William Hooker, in compliment to Earl Stanhope, then President of the Medico-Botanical Society of London. It was introduced from South America to Kew, and flowered there in 1829. (Fig. 164; B. M., t. 2948.)

Var. *flava* has the lip and column like the type, white tinged with yellow. The flowers are very large, reminding one of *S. tigrina.*

S. Jenischiana (*Kramer*).—A synonym of *S. bucephalus.*

Stanhopea.

S. Lowii (*Rolfe*).—This very striking species of the *S. ecornuta* section has purple spots on the hypochil, and whitish-buff sepals and petals. Introduced from Colombia, 1893. Syn. *S. Amesiana*. (G. C., 1893, xiv., 630, 689, fig. 107.)



FIG. 164. STANHOPEA INSIGNIS
(much reduced).

S. maculosa (*Kn.* and *Westc.*).—A synonym of *S. devoniensis*.

S. Martiana (*Batem.*).—This distinct and beautiful-flowered species is not uncommon in cultivation. It is closely related to

Stanhopea.

S. tigrina, differing chiefly in the size and colour of its flowers; these are 4½in. across. The sepals and petals are broad, concave, spreading; sepals creamy-white, with a few purple spots about the base; petals transparent white, marked with large blotches of purplish-crimson. The lip, which is white, has a short, chin-like base and cavity, a pair of broad, taper-pointed horns, and a long, projecting central lobe, with a claw-like tip. The column is 2in. long, club-shaped, not winged, white, with crimson spots. This species is a native of South Mexico, whence it was introduced in 1837. (Batem. Monog., t. 27.)

Var. *bicolor* differs from the type in having the ground-colour of the sepals pure white.

S. oculata (*Lindl.*). — Considerable variation in the markings of its large flowers is found in this well-known, handsome species. The pseudo-bulb is egg-shaped, 2in. long, and furrowed. The leaf has a stout petiole 3in. long, and an ovate blade 1ft. long by 4in. wide. The flower-spike is pendulous, 1ft. long, clothed with boat-shaped, scarious, pale brown sheaths, and bearing three to six flowers; these are 5in. across. The sepals are 3in. long, 1in. broad, reflexed, pale yellow, thickly spotted with purple. The petals are half as large as the sepals, and coloured the same, except that the spots are fewer and larger. The lip is long, narrow, fleshy, the hollowed portion 1in. long, white, with crimson blotches, the front lobe tongue-shaped, with a curved, horn-like lobe on each side, the colour being white, with purple dots. The column is at least 2in. long, narrow in the lower half, winged above, and coloured green, with purple dots. Introduced from Mexico in 1829. (B. M., t. 5300.)

S. platyceras (*Rchb. f.*).—This is the largest-flowered, one of the richest-coloured, and the most remarkable in form, of all Stanhopeas. Our description is taken from a plant that flowered at Kew: Pseudo-bulbs and leaves as in *S. bucephalus*, but stouter. Scape pendulous, short, one-flowered. Flower 7in. across; sepals 3½in. long and 2¼in. broad, wide-spreading, pale yellow or nankeen-coloured, with numerous ring-shaped blotches and spots of rose-purple; petals narrower and shorter, but coloured the same as the sepals; basal part, or hypochil, of the lip boat-shaped, 2½in. long, 1in. deep, and nearly 1in. across; the horns 1in. long, broad, and pointing forwards parallel with the tongue-shaped front lobe; the colour of the boat-shaped portion is deep purplish-crimson inside, paler outside, with spots of a deeper colour; the horns and front lobe are coloured like the sepals; column 3in. long, winged near the top, greenish, with

Stanhopea.

red spots. It is difficult to convey any idea of the extraordinary form and rich colouring of the flowers of this species. Sometimes the scape is two-flowered. Introduced from Colombia by Messrs. Low and Co., and first flowered by Mr. Day in 1867. (Ref. Bot., t. 108.)

S. tigrina (*Batem.*).—One of the most striking of all Orchids; its huge, strangely-formed blossoms, the thick, waxy consistence of the lip and column, the singular colours of the flowers, and the powerful fragrance they exhale, being a combination of



FIG. 165. FLOWERS OF STANHOPEA TIGRINA (much reduced).

characters of a very extraordinary nature. The pseudo-bulbs and leaves are dark green, the latter being broad and about 9in. long. The pendulous scape is clothed with large, boat-shaped, thin, brown bracts, which remain after the flowers have opened. The waxy, fragrant flowers are fully 6in. across. The sepals are almost as broad as long, concave; and the petals are much narrower and wavy—the colour of both being dingy yellow, with large blotches of dull purple, sometimes a single irregular blotch extending over two-thirds of the entire sepal. The cavity of the lip is broad and short; the horns are about 1in. in length, and

Stanhopea.

are suddenly bent forward at right angles; the mid-lobe is over 1in. wide, and is divided at the apex into three fleshy teeth. The column is 3in. long, 1in. wide, narrowed at the base. The colour of the column and lip is pale dull yellow, with numerous spots of purple. Introduced from Mexico, in 1837, by Messrs. Low and Co. (Fig. 165; B. M., t. 4197.)

S. Wardii (*Lodd.*).—In form and markings this beautiful fragrant, and free-flowering species somewhat favours *S. oculata*, but is much brighter in colour, varying from bright yellow to a deep golden-orange, and spotted with crimson. The pseudo-bulbs are egg-shaped, 2in. long. The leaves are large, broad, and leathery. The scape is 9in. long, and it bears from three to nine large flowers; these are 4in. across. The sepals, petals, and lip are similar in form to those of *S. oculata*. The most striking feature in the flowers is the colour of the cavity at the base of the lip, which is almost wholly deep velvety purple, with a satiny sheen. The flowers are usually produced in August, their fragrance being very powerful. Introduced from Guatemala in 1828. Syn. *S. aurea*. (B. M., t. 5289.)

STAUROPSIS.

Four or five species of epiphytal Orchids belonging to the tribe *Vandeæ* are included in this genus. The name, given by the younger Reichenbach, is from *stauros*, a cross, and *opsis*, appearance; so called from the shape of the flower. Sepals and petals free, much spreading; lip continuous with the column, spreading, concave, not spurred, narrow, the lateral lobes short, the middle one rather long; pollen-masses two; racemes few- or many-flowered. Many of the species, which are natives of the Philippines, Burma, and Northern India, are of little horticultural interest. They require the same cultural conditions as *Aërides*.

S. gigantea (*Benth.*).—A robust plant, erect in habit, with deep green, broad, leathery leaves 1½ft. long, bilobed at the apex. The spike is drooping, and usually bears ten to fifteen flowers, the sepals and petals of which are of a deep golden-yellow, unevenly blotched with cinnamon-brown; the lip is small, thick, and fleshy, and, like the column, is white; the whole flower measures 3in. at its broadest diameter. Like *S. lissochiloides*, this Orchid flowers freely only when large, and like it also remains long in bloom. It was originally found on the banks of the Tenasserim River. Syn. *Vanda gigantea*. (B. M., t. 5189.)

Stauropsis.

S. lissochiloides (*Benth.*).—This is a plant of erect, stately habit, attaining a height of 4ft. to 5ft. The stem is 1in. in diameter, and from it the white, long, singularly thick roots proceed. The leaves are remarkably thick and rigid, channelled, pale green, and about 2ft. long. The spike is tall and erect, and bears (according to a plant which flowered at Kew) from twenty to thirty wax-like blooms; these are 2½in. across, with golden-yellow sepals and petals, freely spotted with brownish-crimson; on the outside they assume a purplish hue; the lip is purple-crimson. This species is a native of the Moluccas. It flowered for the first time in this country in June, 1846, with Mr. Bateman. The flowering period extends over three months. Small plants do not flower freely. Syn. *Vanda Batemannii.* (B. R., 1846, t. 59.)

STELIS.

Swartz stands sponsor for this large genus of inconspicuous epiphytal Orchids belonging to the tribe *Epidendreæ.* The name is the old Greek one given by Theophrastus for some parasitical plant. Flowers minute, shortly pedicellate, in terminal, elongated racemes, rarely sub-distichous; sepals spreading, more or less connate; petals much shorter, broad, with thickened margins, often nearly including the column and lip; lip sessile at the base of the column, resembling the petals, or narrowed, or occasionally three-lobed; pollen-masses two. The species, which inhabit tropical America, require similar cultural conditions to *Masdevallia*; they are not often found in cultivation.

STENIA.

Under the above name is found a genus of warm-house epiphytal Orchids belonging to the tribe *Vandeæ.* The name, given by Lindley, is from *stenos*, narrow; in allusion to the form of the pollen-masses. Flowers rather large; sepals of equal length, spreading, the lateral ones rather broader, adnate at base to the foot of the rather thick, erect column; petals similar to the dorsal sepal; lip continuous with the foot of the column, fleshy, broad, nearly saccate, the lateral lobes small, the middle one undivided, or

Stenia.

all broader and fimbriate, the disk crested; pollen-masses four, oblong-linear; scapes short, recurved, one-flowered. Leaves oblong or narrow, coriaceous. Stems shortened. Pseudo-bulbs clustered, one- or two-leaved. The species inhabit Guiana, Columbia, and Peru, and they require the same cultural conditions as the small-growing, warm-house species of *Zygopetalum*. *S. fimbriata* (*Rchb. f.*) and *S. pallida* (*Lindl.*) are occasionally found in cultivation.

STENOGLOTTIS.

Two South African species constitute this genus. It is terrestrial, its nearest ally being *Habenaria*—a genus little known in cultivation outside botanic gardens—and it belongs to the tribe *Ophrydeæ*. Lindley's name is from *stenos*, narrow, and *glossa*, a tongue; in allusion to the narrow lip.

Culture.—In a natural state, both species are found in moist, shaded situations, often on rocks, to which they cling by means of their thick, fleshy, white roots, and form a turf-like mass. Under cultivation, they succeed when potted in a compost of light loam, silver sand, and leaf-soil. A surfacing of live sphagnum is beneficial to the plants, and improves their appearance. Placed in the warmest part of the Odontoglossum-house, and kept fairly moist at all times, these little Orchids thrive admirably. They lose their foliage in winter, when they should be allowed to rest by withholding water, though they must not be allowed to get quite dry.

S. fimbriata (*Lindl.*).—Both the foliage and the flowers of this little species are pretty and attractive. The leaves spread horizontally near the surface of the soil, forming a rosette 6in. in diameter; they are narrowly oblong, undulated at the margin, and of a deep green, prettily marked with longitudinal bands of black-purple spots. The spike is erect, usually 6in. to 12in. high, bearing a great number of small, pale rosy-purple flowers, each ⅓in. across. The lip is spreading, trilobed at the apex, and is marked with a few purple spots. There is considerable variation in this species. Usually the spots on the leaves are numerous and well-defined; in some forms they are faint, and in others are entirely absent. The blossoms are produced in autumn. Introduced from South Africa in 1871. (B. M., t. 5872.)

Stenoglottis.

S. longifolia (*Hook. f.*).—From *S. fimbriata* this species differs in having green, unspotted leaves, 6in. long, and flower-scapes 1½ft. high, bearing a dense raceme of deep mauve-purple flowers, which are twice as large as those of *S. fimbriata*, and have five instead of three lobes in the lip. It is a pretty, free-flowering, easily-cultivated Orchid, which may be grown along with Odontoglossums. The flowers remain fresh about a month. Introduced from Natal in 1888. (B. M., t. 7186.)

STENORRHYNCHUS. This is now included under **Spiranthes.**

TAINIA.

Blume's name for a genus of warm-house, terrestrial Orchids of the tribe *Epidendreæ*, natives of the East Indies, South China, and the Malayan Archipelago. It is from *tainia*, a band or fillet; in allusion to the shape of the lip. Flowers pedicellate, scattered, rather large or mediocre; sepals and petals narrow, slightly acute or long-acuminate; lip erect; column rather long; pollen-masses eight; scape florid, tall, leafless, few-sheathed at the base; raceme terminal, simple. Stems at length thickened into pseudo-bulbs. The species require similar culture to that advised for *Calanthe*; but they are rarely found outside botanic collections. *Ainia* is synonymous with this genus.

TETRAMICRA.

This small genus of epiphytal Orchids belongs to the tribe *Epidendreæ*. The name given by Lindley is from *tetra*, four, and *micros*, small; in allusion to the four small divisions of the anther. Flowers mediocre, pedicellate; sepals and petals sub-equal, few, spreading; lip affixed to the base of the column, free, spreading, the lateral lobes shortly clawed, the middle one broad, entire; column erect, broadly two-winged above or from the base; raceme simple, loose; peduncle terminal, elongated, slender, rigid. Leaves linear, fleshy, semi-terete, or very short and thick. Stems leafy, scarcely thickened, not pseudo-bulbous. The

Tetramicra.

species usually grown—*T. bicolor* (*Benth.*) and *T. rigida*—are best known in gardens under the name of *Leptotes*. They require cool intermediate-house treatment, with cultural conditions as for *Sophronitis*.

T. rigida (*Lindl.*).—A rigid species with cylindrical, linear, channelled, acuminate, recurved foliage. Sepals and petals greenish; lip rosy, purple-striped, exserted, the lateral segments spreading, the middle one roundish-obovate, large; scape distantly sheathed, few-branched above or simple. The flowers are borne in Spring. Introduced from the West Indies. Syn. *Brassavola elegans*. (B. M., t. 3098.)

THELYMITRA.

Twenty species of greenhouse, terrestrial Orchids are included in the genus *Thelymitra* (*Forst.*). It belongs to the tribe *Neottieæ*. Forster's name is from *thelys*, a woman, and *mitra*, a cap; in reference to the hood-shaped column. The species are natives of Australia, New Zealand, and the Malayan Archipelago. They require the same cultural conditions as *Bletia*. *T. grandiflora* (*Fitzg.*) is the species sometimes found under cultivation.

THRIXSPERMUM (*Lour.*). A synonym of ***Sarcochilus.***

THUNIA.

In the "Genera Plantarum," this genus, which is nearly allied to *Phaius*, is included therein. It differs so much, however, from *Phaius* proper in stem, leaf, and inflorescence, and is now so generally known under the above title, that we prefer to retain it as a good garden genus, thereby following the classification of the late Professor Reichenbach. The name is commemorative of Count von Thun Hohenstein. There are probably only two species introduced, although specific names have been given to what are simply varieties of these. The stems are erect, terete, rather herbaceous, of only annual duration, the old stem perishing as the new one develops; they are clothed with leaves to the base, these falling away in autumn. The flowers are produced from the apex of the young

leafy stem in large, drooping clusters; their structure is very like that of *Phaius*, the sepals and petals being arranged above the plane of the lip, the sides of the latter inclosing the column, whilst the front portion is expanded. The species are natives of India, Burma, &c., where they appear to be very abundant.

Culture.—Even the smallest collection should include a few plants of this genus, for no Orchids of equal beauty are more easily grown and propagated. Although they are said to be epiphytal when wild, they thrive best in cultivation when treated as terrestrial plants. Pots at least one-third filled with drainage should be used, and a compost consisting of fibrous peat, loam, and sphagnum, with a sprinkling of silver sand. By using pots 8in. in diameter, three or four stems may be planted together. The soil in the centre should be higher than that at the rim. The proper time for re-potting is as soon in spring as the young growths begin to push from the base of the old stems; all the old soil must then be shaken off, and only sufficient roots to fix the plants firmly should be allowed to remain, a stick sufficiently strong to secure the growth in position being affixed. In full growth liberal supplies of water must be given, but after the flowering season is over and the leaves begin to decay, this should be gradually reduced, and for about three months in mid-winter none at all is needed. It is important that the plants should not be neglected—as is apt to be the case—when the leaves are falling; at that time they should have all the light and air possible. It is on the proper care at this season that the quantity and quality of the next year's flowers depend.

In a batch of Thunias, a good proportion of the stems will each produce two or more young growths. This is the best means of increasing the stock, and is sufficient to meet the requirements of ordinary gardens. If a large number are required, they may be obtained by cutting the old stems into lengths of about 6in., inserting these in pots of sand, keeping them close until young growths appear; when the latter begin to emit roots, they may, with the old piece of stem attached, be potted and treated in the usual way. They will take at least two years to grow to flowering strength.

Thunia.

T. alba (*Lindl.*).—This is a free-growing species, with terete tapering stems 2ft. to 3ft. high, clothed with pale green leaves, which are narrowly oblong, pointed, about 6in. long, and glaucous underneath. The flowers are borne in a pendulous cluster at the apex of the stem, a dozen or more together; each is from 3in. to 4in. in diameter when fully expanded; they are frequently, however, kept half-closed by the large, boat-shaped bract at the base, but this may be remedied by carefully slitting the bract with a sharp knife. The sepals and petals are white, oblong-lanceolate. The sides of the lip inclose the column; the central part is expanded, wavy at the margin, the white ground being faintly marked with pale purple. Introduced from Nepal about 1836; it is common in the Himalayas and Burma. The flowers are produced in June. Syn. *Phaius albus.* (B. M., t. 3991.)

T. Bensonæ (*Benth.*).—An elegant and beautiful species, similar to *T. alba* in general appearance. The stems are 2ft. to 3ft. high. The leaves are pale green on the upper surface, glaucous beneath. The drooping flowers are produced on short, terminal racemes of about ten to twelve; each bloom is between 4in. and 5in. across. The sepals and petals are alike, spreading, narrowly oblong, bright red-purple, of varying depth of shade, but always paler towards the base. The lip is trilobed, rich magenta-purple on the front lobe, which is broadly oblong, frilled, unevenly lobed, and toothed at the margin; the side lobes meet over the column. Introduced from Rangoon in 1867. It flowers in July. Syn. *Phaius Bensonæ.* (B. M., t. 5694.)

T. Brymeriana (*Rchb. f.*).—Allied to *T. Marshalliana*, this species bears large white flowers in terminal drooping heads; the lip is yellow, with radiating crimson lines. The stems are 2ft. high. A native of Burma, whence it was introduced in 1894.

T. Marshalliana (*Rchb. f.*).—There are few Orchids more beautiful than this. It is easily grown, and flowers abundantly. It is considered by some botanists to be a variety of *T. alba*, from which it does not differ in habit, although it is much superior in its flowers. The flowers are 5in. in diameter, and pure white, excepting the front of the lip, which is of a rich golden-yellow, veined with deep orange-red. The sepals and petals are pointed, spreading, and broadly lance-shaped, the base of the lip surrounding the column, the front expanded, prettily frilled

Thunia.

at the edge. A native of Moulmein. Syn. *Phaius Marshalliæ*. (W. O. A., t. 130.)

GARDEN HYBRIDS.

Veitchii *Bensonæ* and *Marshalliana*.
V. inversa *Marshalliana* and *Bensonæ*.
V. superba *Veitchii* and *Bensonæ*.
Wrigleyana..... Syn. *Veitchii*.

TRIAS.

Lindley founded this small genus of creeping Orchids belonging to the tribe *Epidendreæ*. The name is from *treis*, three; and is in allusion to the frequent disposition of the blossoms. The species are natives of Moulmein and the East Indian Peninsula. Sepals sub-equal, spreading, the lateral ones adnate at base of the column; petals small, oblong or linear; lip slightly spreading at the apex, narrow, rather thick; scapes lateral, slender, leafless, one-flowered. Pseudo-bulbs rather small, sub-globose, one-leaved at the apex. These plants require intermediate-house treatment, and a compost of equal portions peat and sphagnum.

TRICHOCENTRUM.

About a dozen species of warm, intermediate-house, epiphytal Orchids, belonging to the tribe *Vandeæ*, are included here. The name given by Pœppig and Endlicher is from *thrix*, *trichos*, a hair, and *kentron*, a spur; and is in allusion to the long thin spur of the labellum. The species are natives of tropical America. Flowers mediocre or rather large; sepals and petals sub-equal, free, spreading; lip at base connate with the column, forming a pitcher, produced into a descending spur, above the pitcher erect, biauriculate, or naked; lateral lobes scarcely dilated, nearly erect; column short, thick; pollen-masses two, ovoid; scapes short, many-sheathed, one- or rarely two-flowered. Leaves coriaceous. Stems very short, one-leaved, at length thickening into a small, fleshy pseudo-bulb. The species, which are chiefly of botanic interest, thrive best suspended in pans or baskets in a moist position of the intermediate-house. They require a liberal supply of root moisture at all seasons of the year.

TRICHOPILIA.

Of the dozen or so of species found in this genus, of the tribe *Vandeæ*, about half are known in gardens. Lindley is responsible for the name—from *thrix*, *trichos*, a hair, and *pilion*, a cap, the anther being concealed below a cap surmounted by a tuft of hair. Trichopilias are related to the Oncidiums and the Brassias, but are distinguished by their two pollen-masses at the end of a long, wedge-shaped caudicle, their large, convolute lip, and the remarkable hood of the column, which is divided into three unequal lobes. The pseudo-bulbs are crowded, usually much flattened, some of them being scarcely thicker than the leaves; as a rule they are smooth and dark green in colour. The leaves are large and leathery, solitary on the apices of the pseudo-bulbs, and they remain on the plant about four years. The large, conspicuous flowers are abundantly produced on short stout basal peduncles, rarely more than three flowers being borne on each. All the species blossom freely when in good health. The flowers last well both when left on the plant and when cut and placed in water. The species inhabit the country from Mexico to Colombia and the West Indies. The genus as now understood includes *Helcia*, and is synonymous with *Pilumna*.

Culture.—The species here described may all be grown in a warm greenhouse, or along with the general collection of Cattleyas. They keep alive and flower now and again when treated as cool-house plants, but they never grow and make a good display of bloom unless they get a fair quantity of heat in summer. They like light too, and should therefore be shaded only from the brightest summer sunshine. They should be grown in pots or baskets, in a mixture of peat and sphagnum, and as they require plenty of water when growing, the drainage should be ample and perfect. A position close to the roof-glass is the best for them. The most favourable time for re-potting Trichopilias is after the flowers are over and new growth has commenced. During winter, the soil about the roots should be kept moist, but not saturated. If any species may be said to thrive under cool-house treatment, it is *T. fragrans*. The plants are all easy to procure from the nurseryman, being abundant where they are wild, easy to

Trichopilia.

import, and easy to establish and keep in health in this country.

T. coccinea (*Warsc.*).—The description under *T. crispa* will suffice for this.

T. crispa (*Lindl.*).—Though this beautiful, free-flowering, variable coloured plant is regarded by many as a distinct species, by others it is classed as a variety of *T. coccinea*, along with *lepida* and *marginata*. Pseudo-bulbs ovate, flattened. 2in. to 3in. long, dark green, one-leaved. Leaves leathery, 6in. by 2in. keeled, acute-pointed. Flower-spikes basal, drooping, short, three-flowered; flowers with pedicels 2in. long; sepals and petals spreading, 2½in. long, ½in. wide, wavy-edged, twisted, brownish-yellow; lip folded over the column, spreading in front, 1½in. across, coloured deep crimson, with a white margin. The flowers are developed in May or June, and sometimes again in the autumn; they remain fresh about a month. All the varieties in cultivation are handsome, and well worth growing. The best of them is the variety known as *marginata*, sometimes considered a distinct species. It has bright carmine sepals and petals, and a large, crimson lip, with a narrow marginal band of white. In other varieties the colour is paler, or the lip is crimson only on the inside of the tube, the spreading portion being white. Costa Rica, 1849. (B. M., t. 4857.)

T. fragrans (*Lindl.*). — An elegant, large-flowered, very fragrant Orchid, and one of the easiest to cultivate. Its clustered pseudo-bulbs are oblong, 3in. to 5in. by 1in., much flattened, smooth, dull green, one-leaved. Leaves leathery, 9in. long, 2in. wide, acute-pointed. Flower-spikes springing from the base of the matured bulb, 9in. to 12in. long, about six-flowered; flowers nodding, on pedicels 3in. long; sepals narrow, 2½in. long, wavy and twisted, usually greenish-white; lip folded at the base, the front spreading, 1½in. across, more or less lobed, pure white, with a blotch of yellow in the throat. This plant thrives when grown in a cool house. It should be planted in a pot, in peat and sphagnum, and be kept moist all the year round. The odour of the flowers is almond-like; they are developed in summer, and remain fresh about a month. Native of Colombia, 1856. Syn. *Pilumna fragrans*. (B. M., t. 5035.)

Var. *nobilis*.—Pseudo-bulbs larger and stouter. Leaves shorter and broader. Sepals and petals white, 2in. long, scarcely twisted; lip larger than in the type. This is a much finer Orchid than *T. fragrans*. Syn. *Pilumna nobilis*.

T. Galeottiana (*A. Rich.*).—Though not one of the best of the cultivated Trichopilias, it is worth growing on account of

Trichopilia.

the distinct colour, size, and number of its flowers. The pseudo-bulbs are about 5in. long by 1in. wide, flattened, smooth, one-leaved. The leaves are leathery, tapering at both ends, with a



FIG. 166. FLOWER OF TRICHOPILIA SUAVIS
(nat. size).

prominent keel, the largest being 6in. long by 2in. broad. The flower-spikes are short, decumbent, produced from the base of the pseudo-bulbs, and each bears one or two flowers 3in. across. The sepals and petals are 2in. long, ½in. wide, tapering, not

twisted, greenish-yellow; the lip is folded at the base, the front lobe spreading, 1½in. across, notched, white, with a yellow throat and a few blotches of crimson. This species varies somewhat in the size and tinting of its flowers. Mexico, 1859. (B. M., t. 5550.)

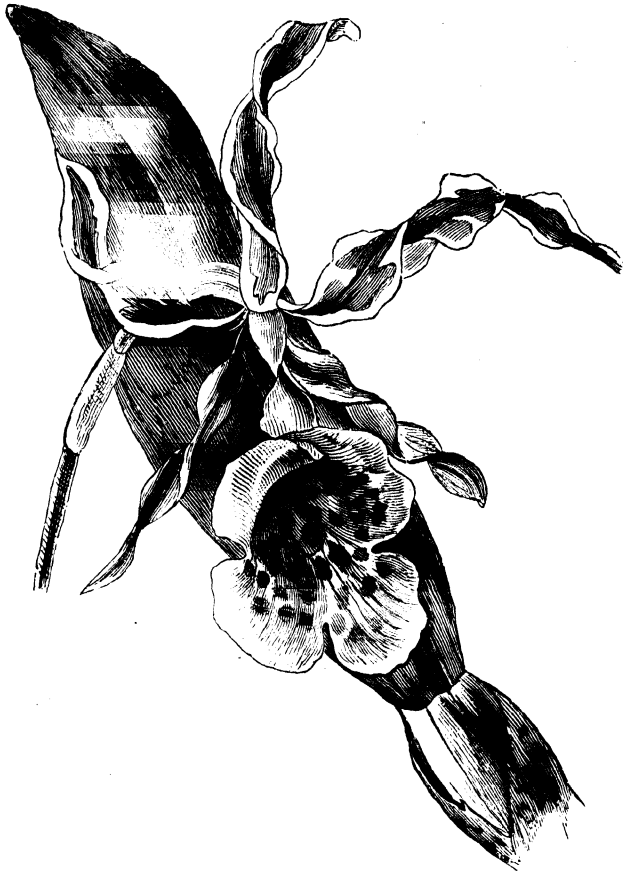


FIG. 167. FLOWER AND LEAF OF TRICHOPILIA TORTILIS (nat. size).

T. lepida (*Veitch*).—Flower-spikes springing from the base of the matured growth, drooping, 6in. long, usually three-flowered; flowers on flexuous pedicels, and each fully 6in. across; sepals and petals spreading, narrow, wavy, not twisted, rosy-purple, white along

Trichopilia.

the margins; lip trumpet-shaped, the front lobe spreading, 1½in. across, crisped and wavy, almost crimson inside, becoming paler towards the margin, which is white. This plant blossoms in April or May, and keeps fresh for about three weeks. There is very little difference between this and several other so-called species. Indeed many authorities regard it as a variety of *T. coccinea*. Except in colour this plant closely resembles *T. crispa*. (W. O. A., t. 197.)

T. marginata (*Henfrey*).—A variety of *T. coccinea* whose chief characteristics are considered under *T. crispa*.

T. suavis (*Lindl.*).—A large-flowered, fragrant species, easily grown, and a popular garden plant. It has broad, thin pseudo-bulbs 2in. long, each bearing a large, dark green, leathery leaf 8in. long by 3in. wide, and keeled. The peduncles are produced from the base of the last-matured pseudo-bulbs, and they are short, decumbent, usually three-flowered, each flower having a long, flexuose stalk. The sepals and petals are narrow, wavy, 2in. long, nearly straight. The lip is large, three-lobed, the side lobes being folded over the column, and forming a tube, the front lobe spreading, 2in. across, crisped and wavy at the edge. The colour of all the parts of the flower is nearly white, with spots and stains of red, the inside of the tube being yellow. The odour of the blossoms resembles that of hawthorn. They are developed in May or June, lasting about a month. When well managed, this species flowers very freely, small plants producing quite a crowded whorl. It is a native of Central America, where it grows on oaks and other trees at an elevation of 5000ft. to 9000ft. Introduced in 1848. (Fig. 166; B. M., t. 4654.)

Var. *alba* is a pure white variety, marked on the disk of the lip with a three-lobed yellow blotch.

T. tortilis (*Lindl.*).—An old and favourite garden Orchid, being easy to manage, and a free-flowering, ornamental plant. Its pseudo-bulbs are from 2in. to 4in. long, 1in. wide, much flattened, dark green, one-leaved. Leaves leathery, ovate, 6in. long, keeled, dark green. Flowers on decumbent stalks, usually solitary; sepals and petals spreading, narrow, 2in. long, spirally twisted, pointed, their colour brown, with a yellowish border; lip folded, and forming a tube at the base, the upper part broad, spreading, 1½in. across, lobed, white, with crimson spots, almost wholly crimson inside the tube. This species blooms very freely, small plants when in vigorous health producing a score or more flowers, that remain fresh about a month. It blossoms in summer, and sometimes again in winter. Mexico, 1835. (Fig. 167; B. M., t. 3739.)

TRICHOSMA.

This monotypic genus of the tribe *Epidendreæ* is nearly allied to *Cœlogyne*, from which it chiefly differs in its erect, tufted stems; it has also been included under *Eria*. The species is an epiphyte, and a native of the Sikkim Himalaya and Khasia Mountains, whence it was introduced in 1840. The name given by Lindley is from *treis*, three, and *chosma*, a division; in allusion to the three-lobed labellum.

Culture.—This is one of the most easily-cultivated of Orchids. It delights in a cool, moist atmosphere, and may be grown with the Odontoglossums. Imported plants should be kept in the intermediate-house until fully established. They should be potted in fibrous peat and sphagnum, and, as copious supplies of water are necessary during growth, perfect drainage is essential. Although less water is needed in winter, the roots must at no time be allowed to remain dry. Provided a vigorous, healthy growth be obtained, this Orchid seldom fails to flower.

T. suavis (*Lindl.*).—An extremely pretty, free-flowering plant that certainly deserves more notice than it has hitherto received It has slender, tapering stems about 8in. high, surmounted by two bright green, oblong leaves, between which the four- to eight-flowered raceme is produced. The flowers are 1½in. in diameter, and delightfully fragrant. The sepals and petals are lance-shaped, creamy-white; the lip is three-lobed, the side lobes are white, striped with brownish-crimson, and the middle one crested, yellow, with crimson at the edges. It flowers in October and November. (B. R., 1842, t. 21.)

TRIGONIDIUM.

Botanically interesting Orchids belonging to the tribe *Vandeæ*. Lindley's name is from *trigona*, a triangle, and *eidos*, like, and has reference to the triangular form of several parts of the plants. The species require a warm intermediate-house, suspended in baskets, the compost consisting of good fibrous peat and sphagnum. They like a fairly light position.

UROPEDIUM. This genus, founded by Lindley, is now included under **Selenipedium.**

VANDA.

Few genera possess qualities better calculated to recommend them than this. The name *Vanda* was communicated to Dr. Robert Brown, the founder of the genus, by the eminent scholar and linguist Sir William Jones. It is a Sanscrit word of rather wide import, for it seems to have been used for the common Vanda of Bengal and North-east India (*V. Roxburghii*), and also for other Orchids of similar habit. The genus was selected by Dr. Lindley as the type of one of the fundamental (tribal) divisions of the order—*Vandeæ*. It includes about twenty species, the majority of which are easy to cultivate, handsome in habit, and very beautiful in bloom. *V. suavis* and *V. tricolor* have perhaps the stateliest habit of all Old-World Orchids; and in *V. cærulea* and *V. Sanderiana* we have exceptional size and beauty of colour in the flowers. All the species are evergreen and epiphytal; they are distributed over a large area, stretching from the Himalayas, through India to the Malayan Archipelago, one species being found in tropical Australia. The first species to make its appearance in the gardens of this country was *V. Roxburghii*, which flowered in 1820. The leaves are most frequently strap-shaped, occasionally oblong, and in a few species terete, almost always distichous and of leathery texture, the apices being either bilobed or curiously jagged. The flowers are in few- or many-flowered racemes, which originate at the base of the leaves, either in the axils or on the opposite side of the stem. The sepals and usually similar petals are spreading, often much narrowed towards the base; the lip is continuous with the short, thick column, the front portion being expanded, the small side lobes erect, and the base forming a short spur or sac. The flowers are fragrant, and remain for a long time in beauty.

Culture.—Vandas may be grown in either pots, baskets, or cylinders: for the larger species, such as *V. suavis*, *V. tricolor*, &c., pots are preferable; whilst baskets or cylinders are best for the dwarfer kinds, most of which dislike having their roots confined, and enjoy a position near the glass. Small plants and slow-growing species may be grown in hanging-baskets. Whatever vessel is used, it should be three-fourths filled with clean potsherds, and the remainder with clean, fresh sphagnum. During

the growing season, which lasts from March to October an abundance of moisture, both at the root and in the atmosphere, is indispensable; care should also be taken that a regular supply of fresh air is ensured. When at rest the plants require much less water, but it is important that they should not be allowed to get dry at any time. As soon as they begin to grow again, which is usually about March, the old sphagnum and loose potsherds should be removed without disturbing the roots, and replaced with clean, new material.

The geographical distribution of Vandas is so wide, and the conditions of temperature and atmosphere are so varying, that it is impossible to treat of the cultivation of the whole as one. *V. cærulea*, for instance, grows on the tops of trees on the Khasia Hills, where hoar-frosts are not infrequent; whilst *V. teres* is subjected at some seasons of the year to severe drought. The treatment which has proved most successful is given under each of these species.

V. suavis and *V. tricolor* are frequently subjected to a much higher temperature than is good for them. The idea that they require stove treatment throughout the whole year is an erroneous one, and, if carried out, usually results in "leggy" plants and comparatively flaccid foliage, together with a deterioration in the quality and quantity of the blooms. We have found that the above-named species succeed best in a moist position in the stove or East Indian-house, say from March, when they commence to grow, until the green tips of the roots become sealed over with the outer film, which occurs late in the autumn. The plants should then be subjected to cooler conditions, with only sufficient moisture to keep the foliage in a normal, plump state. When the plants lose their lower leaves through either age or improper treatment, it is the usual practice to cut off the bottom part of the stem and lower them. If the plant has developed roots above the pot, this may be done with safety, provided reasonable care be afterwards taken in shading and watering. When this is not the case, such treatment is much to be condemned; it is better, by careful shading, and otherwise treating the plants as recommended above, to encourage the growth of young shoots from the base.

Vanda.

V. Sanderiana we find to succeed best in the warmest and moistest position in the stove, but it should be subjected to cooler conditions during the lengthened season of rest. Where not otherwise mentioned, the remainder of the species should be grown in a temperature of from 65deg. to 80deg. in summer, gradually falling to from 55deg. to 60deg. in winter.

V. Amesiana (*Rchb. f.*).—This distinct and delicately beautiful species is a dwarf plant, with stiff, fleshy, dark green leaves 1ft. long by nearly 1in. broad at the base, tapering gradually to a long, fine point. The fragrant flowers are in erect racemes of twenty to fifty; the sepals and petals are white, flushed with rose, and the lip is rich magenta-rose, except on the margin, which is paler; the flowers are 1½in. to 2in. in diameter, and their general aspect may be likened to that of a *Phalænopsis*. This species was introduced from the Shan States, Upper Burma, by Messrs. Hugh Low and Co., in 1887. It flowers at various seasons. A considerable variation in colour is already apparent in cultivated specimens, the above being the typical form. It is said that in its natural state as many as eighty flowers are borne on a single spike. It will probably thrive under the same treatment as is recommended for *V. cærulea*, as hoar-frosts are said to occur in its habitat. (B. M., t. 7139.)

V. Batemannii (*Lindl.*).—A synonym of *Stauropsis lissochiloides*.

V. Bensoni (*Batem.*).—A desirable species, with erect stems 1ft. high, bearing leathery, strap-shaped leaves from 6in. to 8in. long. The flowers are 2in. in diameter, and are produced, ten or fifteen together, on racemes 1ft. to 1¼ft. long; the sepals and petals are obovate, white behind, yellowish-green in front, marked with numerous reddish-brown dots; the apex of the lip is of a soft violet colour, the central part is rosy-pink, and the two small lobes at the base, as well as the spur, are white. Burma, 1866. (B. M., t. 5611.)

V. cærulea (*Griff.*).—In colour, as well as in wealth of bloom, this species stands supreme amongst Vandas. Long after its introduction in 1849 it continued to be a rare plant, owing chiefly to improper treatment. Its requirements being now understood, the species has acquired great popularity. It is, perhaps, the finest of all Orchids that flower in autumn. The stems are usually from 1ft. to 2ft. high (sometimes more), bearing two opposite rows of dark green, rigid leaves 6in. to 8in. long, strap-shaped, and unequally two-lobed at the tips. The racemes are 1ft. to 2ft. long, and the flowers 4in. in

diameter; over a score of the latter have been obtained on a single raceme, but twelve is a good average number. The oblong sepals and petals are of a beautiful pale lavender-blue, the small lip being more distinctly blue. In good varieties the parts of the flower overlap, and are often prettily tessellated with a darker shade. When they first expand, the flowers are much smaller and paler than they finally become. Northern India and Burma.

The cultivation of this species differs somewhat from that of other Vandas. Chiefly, it requires less heat. On its native hills it is occasionally subjected to frost, and this it withstands without permanent injury. Under cultivation it may be grown with the Cattleyas, or even in the vinery, but a sunny position, and, above all, a constant supply of fresh air are essential. Shading should only be used during the hottest sunshine. It does not like to have its roots confined, and we find that it thrives most satisfactorily in baskets of teak. Abundance of water must be given during active growth, but from December to the time when the roots give signs of new growth but little is needed.

V. cærulescens (*Griff.*).—A distinct and charming species with stems ½in. in diameter and 6in. to 1ft. high, bearing coriaceous, distinctly-channelled leaves 6in. in length, the apices of which are unevenly cut. The flowers are 1in. to 1½in. across, and upwards of a dozen are produced on the slender, erect scape; the sepals and petals are ovate, spreading, slightly incurved, and of a pale purplish-blue, the smaller lip being of a rich violet-blue, with the anterior portion standing almost at right angles to the base. This species was originally discovered in Burma by the eminent Indian botanist Griffiths, in 1837, but was not introduced to commerce until 1869. (B. M., t. 5834.)

Var. *Boxallii* has the sepals and petals white, with a lilac tinge, and a deep violet-blue lip. (B. M., t. 6328.)

V. Cathcartii (*Lindl.*).—A synonym of *Arachnanthe Cathcartii*.

V. Denisoniana (*Rchb. f.*).—A dwarf species, whose lovely white flowers distinguish it from all other Vandas. The leaves are 6in. to 10in. long, strap-shaped, and much decurved; from their axils the four to six-flowered racemes are produced, each flower being about 2in. in diameter. The upper sepal and the two petals are broadly spathulate, the lower sepals being more ovate, narrowed at the base. The lip is contracted in the middle, the terminal portion dividing into two outwardly curving lobes. Reichenbach compared its shape to that of a black-cock's tail. Burma, 1869. It blooms during the summer months. (B. M., t. 5811.)

Vanda.

Var. *hebraica* has sulphur-coloured sepals and petals, curiously marked on the inside with spots and bars, the resemblance of which to Hebrew characters suggested the name. Burma, 1885. (W. O. A., t. 248.)

V. gigantea (*Lindl.*).—A synonym of *Stauropsis gigantea.*

V. Hookeriana (*Rchb. f.*).—One of the most remarkable Vandas in cultivation. It has terete stems and leaves, as in the better-known *V. teres*, from which, however, it may be easily distinguished by its paler green, pointed, and slenderer leaves, and its altogether less robust appearance. Under cultivation



FIG. 168. FLOWER OF VANDA HOOKERIANA
(⅔ nat. size).

the racemes usually produce two flowers, but specimens have been collected in a wild state bearing as many as five; each flower is 2½in. in diameter. The sepals are oblong, white, tinged with rose. The petals are broadly spathulate, wavy, larger than the sepals, white, spotted with magenta. The lip is 1½in. broad, white, the side lobes being lined transversely, and the middle one longitudinally, with magenta-purple; spots of the same colour occur round the edges; at the base there are two triangular, deep purple appendages, one on each side of the column. After several unsuccessful attempts to introduce this species alive, the task was finally accomplished by Messrs. Hugh Low and Co. in 1873, but these plants did not flower until 1882.

Vanda.

It may be successfully grown under treatment similar to that recommended for *V. teres*. It is a native of Malaya, whence it was introduced in 1882. (Fig. 168; W. O. A., t. 73.)

V. insignis (*Blume*).—A distinct and handsome species. The erect stem bears stiff, strap-shaped, recurving, deeply-keeled leaves about 10in. long. The axillary racemes bear six to ten flowers, each 2½in. in diameter; the fleshy sepals and petals are obovate, and on the inside are of a tawny-yellow, blotched with a deep reddish-brown; on the outside they are almost white. The lip is of a rose-tinted white, the side lobes being small, and the central one ladle-shaped and about 1in. across. For many years a totally different plant, a variety of *V. tricolor* and a native of Java, was grown under this name, which was originally given to the species by Blume. The flowers are borne at mid-summer. A native of Timor. (B. M., t. 5759.)

Var. *Schrœderiana* has sepals and petals of a light orange-yellow, and a cream-coloured lip.

V. Kimballiana (*Rchb. f.*).—This lovely species was introduced by Messrs. Hugh Low & Co., with whom it flowered for the first time in the autumn of 1889. The leaves differ from those of any other *Vanda*, and may be described as intermediate between those of *V. Amesiana* (its nearest ally) and the terete form seen in *V. teres*; they are 1ft. in length, narrow, subulate, with a thin furrow running down the upper side, and are closely arranged on the stem. The flowers are 2in. to 3in. in diameter. The sepals and petals are of the purest glistening white; and the lip is of a beautiful rosy-purple, except the small side lobes, which are yellow, spotted with light brown. The upper sepal and the petals are much smaller than the two oblong lower sepals. The lip is broad and spreading, prettily frilled at the margin. The spur is 1in. long and slightly recurved. A native of Burma. (B. M., t. 7112.)

V. Lowii (*Hort.*).—A synonym of *Arachnanthe Lowii*.

V. Parishii (*Rchb. f.*).—A distinct and beautiful species, stout and dwarf in habit, and of very slow growth. The leaves are bright green, thick, and fleshy, in shape oblong, tapering somewhat towards each end, and notched at the apex. The raceme is ascending, and bears six to ten flowers; the sepals and slightly broader petals are firm in texture, cuneate-oblong, the greenish-yellow ground spotted freely with bright reddish-brown; the lip is white, striped with orange at the base, the front lobe being of a pale magenta, bordered by a thin margin of white. It is a native of Burma, where it was originally

discovered in 1862 by the Rev. C. Parish; it was not introduced, however, until 1870. This species enjoys an abundance of light, and as it does not like its roots confined, it ought to be planted in a basket and suspended near the roof-glass. (W. O. A., t. 15.)

Var. *Marriottiana* is remarkably distinct. Unlike the typical form, its flowers are odourless. The sepals and petals are shining brown, tinged with magenta. Introduced in 1880. (W. O. A., t. 61.)

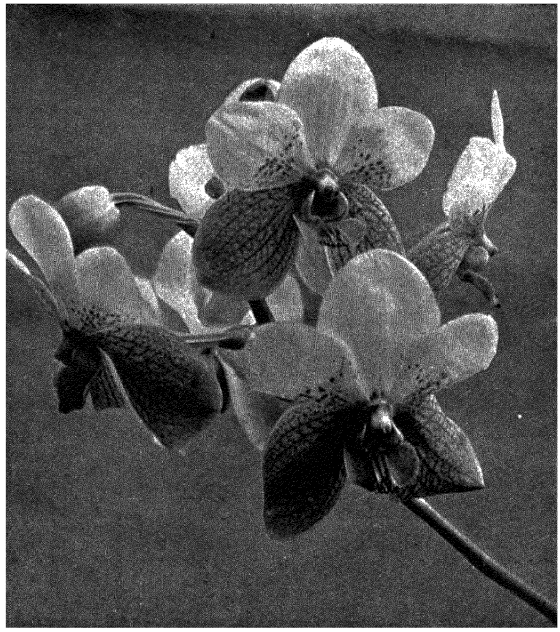


FIG. 169. FLOWERS OF VANDA SANDERIANA
(much reduced).

V. Roxburghii (*R. Br.*).—In this handsome species the stems are 1ft. to 2ft. high, and bear two rows of narrow, leathery, recurved and channelled leaves, 6in. to 8in. long. The flowers are strongly perfumed, and about 2in. in diameter, six or seven (sometimes as many as a dozen) occurring on the erect spike; the sepals and petals are white outside, and pale yellowish-green, tessellated with olive-brown, inside; the middle lobe of the lip is violet-purple, the side lobes are white, and the short, recurved

spur is rosy-pink. The plant flowers from May to August, remaining for over a month in perfection. India, 1850. (B. M., t. 2245.)

V. Sanderiana (*Rchb. f.*).—The largest-flowered of all Vandas, each flower measuring about 5in. across. The plant is erect in growth, with recurved, leathery, strap-shaped leaves 1ft. in length, from the axils of which the stout racemes proceed. Twelve or even more flowers are borne on the raceme. The upper sepal and the smaller petals are broadly oval, and of a pale rosy-lilac, tinged with yellow and dotted with crimson at the base. The lower sepals are larger, measuring 2in. in diameter, yellow outside, fawn-tinted inside, where they are covered (except at the edges) with a network of brownish-crimson. The lip is small, concave behind, the anterior portion being flatter, but curled up at the sides; it is coloured dull crimson, and is greenish-yellow towards the base. Altogether the coloration of the flower is most remarkable, as well as beautiful. In outline there is a considerable resemblance to *Miltonia vexillaria*, the large lip of the latter being represented by the two large sepals of the *Vanda*. This species was discovered in 1881, on the Island of Mindanao, one of the Philippine group. It flowers in September. From April to October—the growing season—the plants should be given the warmest and moistest position available. (Fig. 169; B. M., t. 6983.)

V. suavis (*Lindl.*).—One of the oldest and best-known of the genus. It is of tall, erect habit, and handsome when well clothed with foliage and in perfect health; it blooms profusely, and the sweetly-scented flowers remain long in perfection: it is a plant that ought certainly to be in every amateur's collection. The stems are 2ft. to 5ft. high, with two rows of deep green, strap-shaped, decurved leaves 10in. to 12in. long. The axillary racemes bear about a dozen flowers, each measuring 2in. to 3in. across. Both the sepals and petals are spathulate, wavy, white on the outside, thickly streaked and spotted with crimson-purple inside. The petals are bent and twisted back to front. The lip is three-lobed, convex, the side lobes being of a deep rosy-purple, the central one paler, and deeply notched at the apex. The flowers are developed irregularly, but usually from March to May. Java, 1847. (B. M., t. 5174.)

V. teres (*Lindl.*).—A climbing species of singular and somewhat inelegant habit, but of great beauty in flower. It has dark green, rounded stems, about the thickness of a goose-quill, with rigid, cylindrical leaves 6in. long. The raceme is axillary, a few inches from the top of the stem, erect, and bears from three to

Vanda.

six flowers, each 3in. across. The sepals are oblong, white, tinged with rose; the petals are larger and more rounded in outline than the sepals, which they overlap, and are coloured deep rose. The front portion of the lip is deep rose, veined with yellow; in the throat it is orange, striped and spotted with crimson. The side lobes curl upwards, forming a hood over the column; whilst the front lobe is spreading and deeply cleft at the apex. The flowering season extends from May to September. This species is found in India, and was introduced in 1828. The striking beauty of this species has long been known to

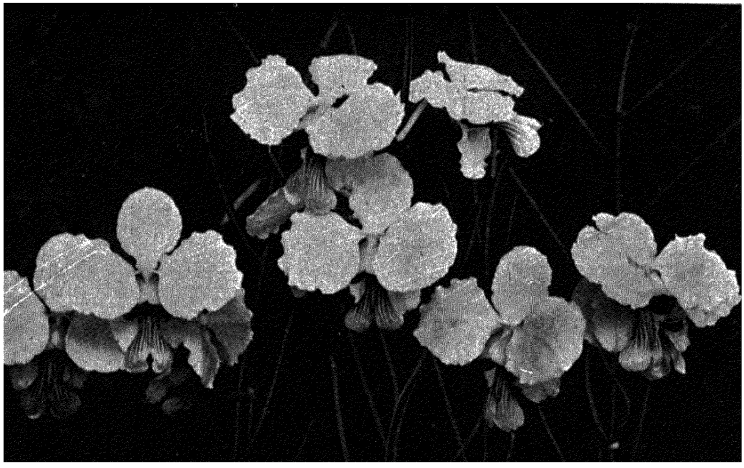


FIG. 170. FLOWERS OF VANDA TERES (much reduced).

horticulturists, but it is only during recent years that it has acquired any degree of popularity. Previously most cultivators experienced difficulty in inducing it to flower; but that this was simply the result of improper treatment is apparent from the success with which it is now grown and flowered. The first requisite is a sunny position in a warm house which can be kept unshaded at all times. If sufficient plants are available, it is best to prepare a bed for them consisting of a 4in. layer of drainage, on which is laid an equal thickness of sphagnum. After cutting the stems into suitable lengths, plant them in this, about 6in. apart. If there are only a few plants, they may be

Vanda.

grown in pots. During summer they should be frequently syringed about four in the afternoon, shutting the ventilators. The temperature should not fall below 70deg. during the night, and water must be given unstintingly. In winter a temperature of 55deg. to 60deg. will suffice, and the plants should be kept dry. (Fig. 170; B. M., 4114.)

V. tricolor (*Lindl.*).—In foliage, habit, and inflorescence, this Orchid is very similar to *V. suavis*; Reichenbach considered them both varieties of one species. The chief distinction lies in



FIG. 171. FLOWER OF VANDA TRICOLOR PATERSONI (nat. size).

the colour of the flower, *V. suavis* having a white ground, *V. tricolor* a yellow; but the two are linked by intermediate forms. The racemes usually bear about twelve flowers, although in vigorous specimens as many as eighteen have been obtained. Each flower is 2in. to 3in. in depth. The sepals and petals are obovate, narrowed towards the base, wavy, yellow (of various shades), spotted and blotched with brownish-crimson. The lip is about 1in. long, notched at the apex, and of a bright magenta-purple, with white, parallel lines at the base; the small, erect side lobes are

Vanda.

white. Java, introduced, along with *V. suavis*, in 1847. (B. M., t. 4432.)

Of the named varieties now in cultivation the following are the most distinct:—

Var. *insignis.* — Sepals and petals pale yellow, with crimson markings; lip lilac.

Var. *Patersoni.*—Sepals and petals bright yellow, blotched with rich brownish-crimson; lip magenta-crimson. (Fig. 171, for which we are indebted to the Editor of the "Gardeners' Chronicle.")

Var. *planilabris.*—A very large-flowered variety. Sepals and petals unusually broad, the yellow ground-colour being streaked with rich brown; lip rose-coloured, with brownish-purple lines at the base.

Var. *Russelliana.*—A well-marked variety, distinguished by its pendulous racemes.

Vars. *Dodgsoni*, *Leopoldi*, *suaveolens*, and *Warneri*, are also handsome plants.

GARDEN HYBRID.

Miss Agnes Joaquim.. *Hookeriana* and *teres*.

NATURAL HYBRIDS.

amœna *Roxburghii* and *cæruiea*.
Charlesworthii *cærulea* and *Bensoni*
Moorei *cærulea* and *Kimballiana*.

VANILLA.

Swartz founded this genus, embracing about a score species of stove climbing Orchids belonging to the tribe *Neottieæ*. The species are scattered over the tropical regions. They are rarely cultivated in Orchid collections. Flowers large but usually dull-coloured and uninteresting, in short spikes; sepals and petals sub-equal, free, spreading; claw of the lip adnate with the elongated wingless column; the limb broad, concave, its base rolled round the column; bracts ovate. Capsule often elongated, fleshy. *Vanilla* is remarkable for being the only genus of the Order that possesses any economic value, the fruits of several of the species being used for flavouring purposes. The species should be grown in large pots or planted out in beds, in a compost of fibrous loam, leaf-soil, peat, and sphagnum, with plenty of sand intermixed. The generic name is from the Spanish *vainilla*, a little sheath; in allusion to the shape of the fruit.

WARREA.

As at present constituted, this genus of stove Orchids, belonging to the tribe *Vandeæ*, contains but two or three species. It was named by Lindley in honour of the discoverer, Frederick Warre. Flowers showy, shortly pedicellate; sepals and petals broad, concave, the lateral ones oblique at the base, adnate to the foot of the rather long clavate column; lip affixed to the foot of the column, sessile, very shortly contracted towards the base, and incumbent, at length erect, broad, and concave, the lateral lobes scarcely prominent, the middle ones expanded, entire or bifid, the disk having elevated fleshy lines; pollen-masses four; racemes elongated, loose; scape leafless, many-sheathed, tall, simple; bracts short. Leaves few, distichous, elongated. Stems leafy. The species, which are natives of Peru, Brazil, Colombia, &c., require warm, intermediate-house treatment, but are rarely seen in cultivation outside botanic collections.

WARSCEWICZELLA (*Rchb. f.*). This is now included under **Zygopetalum.**

XYLOBIUM.

Little-known stove epiphytal Orchids belonging to the tribe *Vandeæ*, natives of tropical America. The name given by Lindley is from *xylon*, wood, and *bios*, life; in allusion to the substance on which the plants grow. Flowers racemose, very shortly pedicellate; sepals erect, at length somewhat spreading, the lateral ones broader than the upper one, adnate at the base to the foot of the column, forming a chin; petals similar to the upper sepal, but smaller; lip sub-articulated with the foot of the column, sessile, or contracted, and incumbent at the base, at length erect, the lateral lobes erect, clothing the erect, semi-terete column, the middle one short, broad, and spreading; scapes at the bases of the pseudo-bulbs, erect, simple. The species, which are of botanic rather than horticultural interest, require intermediate-house treatment.

ZEUXINE.

Although over seventy species of this genus of terrestrial Orchids, of the tribe *Neottieæ*, have been described, they are seldom seen outside botanic collections. As now constituted, this genus includes *Monochilus*. The species are natives of tropical Africa, the East Indies, and the Malayan Archipelago, and require the same cultural conditions as *Anæctochilus*. Lindley's name is from *zeuxis*, a joining; in reference to the coherence of the petals with the upper sepal. Flowers small, in sessile spikes; upper sepal erect, concave, the lateral ones spreading; petals narrow, often cohering with the upper sepal in a hood; lip adnate to the base of the very short column, erect, concave, or slightly saccate at the base, within naked, or with two calli, more or less contracted above the base. *Z. regia* (*Trimen*) is the species sometimes found in collections.

ZYGO-BATEMANNIA.

A bigeneric hybrid, obtained by crossing *Zygopetalum* and *Batemannia*. It requires to be treated like the warm-house species of *Zygopetalum*.

Mastersii *Z. crinitum* and *B. Colleyi*.

ZYGO-COLAX.

A bigeneric hybrid, obtained from *Zygopetalum* and *Colax*. The principal cultural requirement is a warm, moist position in the intermediate-house. The potting compost should consist of one part fibrous peat, one part decayed leaves, and the remaining portion living sphagnum and sand.

Amesiana *Z. brachypetalum* and *C. jugosus* (Sander).
leopardinus *Z. maxillare Gautieri* and *C. jugosus* (Wigan).
Veitchii *Z. crinitum* and *C. jugosus* (Veitch).
Veitchii Kromerii
(Fig. 172) (appeared amongst an importation of *Z. crinitum*. It is identical with *Z.-C. Veitchii*, excepting its larger flowers).
Wiganianus *Z. intermedium* and *C. jugosus* (Wigan).

ZYGOPETALUM.

In gardens this genus, of the tribe *Vandeæ*, is confined to about a dozen species, characterised by stout pseudo-bulbs,

Zygopetalum.

strap-shaped, leathery leaves, more or less erect, and flower-scapes that spring from the base of the matured pseudo-bulbs and bear from four to eight flowers. The type-plant of these is *Z. Mackaii*, on which the genus was founded by Lindley in 1827. The sepals and petals are almost alike in size, form, and colour; they are arranged on the same plane, are partly joined to each other at the base, and are directed upwards above the level of the centre of the flower, almost fan-like. The lip is the most striking part of the flower, being large, spreading, flat, almost leathery in texture, and brightly coloured; the crest or disk is thick and fleshy, usually furrowed or toothed, sometimes not unlike the old-fashioned ruff. All the species flower in the winter season. According to the "Genera Plantarum," there are forty species of *Zygopetalum*, but these include the plants known in gardens under the following names: *Bollea*, *Huntleya*, *Pescatorea*, *Promenæa*, and *Warscewiczella*. The large, spreading, usually purple labellum, with its prominent, fleshy, ruff-like crest, and the short, fleshy column, are characters which, in conjunction with those already mentioned, enable one to readily distinguish all the plants known in gardens as Zygopetalums. The generic name is from *zygos*, a yoke, and *petalon*, a petal; the sepals and petals in the original species adhere by their bases.

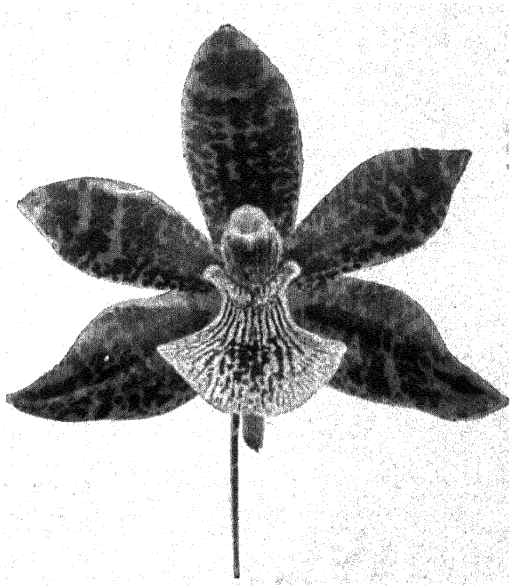


FIG. 172. ZYGO-COLAX VEITCHII KROMERII (nat. size).

Zygopetalum.

Culture.—Although all the kinds are epiphytal in a state of nature, they thrive and flower better when grown in pots than when cultivated on blocks or in baskets. They require plenty of moisture at all times, and a rich, well-drained peat-soil, such as suits the Odontoglossums. The temperature of a warm greenhouse suits the robust-growing species; while stove-house treatment is better for *Z. rostratum* and those formerly known as *Promenæa*, *Pescatorea* and *Warscewiczella*. Here, also, leaf-soil and rough sand should be substituted for the peat, surfaced at the top with a layer of roughly-chopped living sphagnum.

Z. Burkei (*Rchb. f.*)—Flowers about 2½in. across; sepals and petals green, with longitudinal interrupted, or continuous lines of chocolate-brown, the apices often being suffused with the same colour; lip white, with a fleshy crest, ribbed with violet-purple. Pseudo-bulbs nearly tetragonous, shining, very thick. Demerara, 1883.

Z. Burtii (*Batem.*).—This most attractive species is better known as a *Batemannia*. Flowers 3in. to 4in. in diameter, all the segments more or less fleshy; sepals and petals sub-equal, obovate-oblong, acute, white at the base, then yellow, the apical half red-brown, with some yellow spots; petals with some crimson-purple streaks at the base; lip clawed, narrowly elliptic-oblong, acute, reflexed, the basal half white, the apical half red-brown; crest a semicircular white plate, fringed with long, narrow, light purple incurved teeth. Column triquetral, winged and hooded, with the margin jagged, pale green, and a purple spot on each side of the stigma. Costa Rica.

Z. cerinum (*Rchb. f.*).—A charming species, with tufted, oblong, pointed leaves, from 10in. to 12in. long, and basal flower-stems, each of which is about 6in. long, and bears a flower about 3in. in diameter. The rounded, oblong sepals are concave, fleshy, and straw-coloured, the upper one, as well as the similarly-shaped but smaller petals, being paler. The lip is yellow, with a thick, semicircular crest on the centre, and a contracted base. The column is short and club-shaped, sometimes deep purple near the base. This species flowers at different periods, and remains long in beauty. It was introduced, in 1851, from Chiriqui, where it grows at an altitude of 8000ft. Syns. *Huntleya cerina* and *Pescatorea cerina*. (B. M., t. 5598.)

Z. cœleste (*Rchb. f.*).—A bright and distinctly coloured species, well worth cultivating on account of its unusual tints,

Zygopetalum.

which, if not actually the much-coveted blue, are a near approach to it. The peduncle is 1¼ft. to 1½ft. high, and bears one flower, which is sometimes 4in. in diameter. The oblong, pointed sepals, and rather smaller petals, are light blue at the base, changing to mauve in the middle and white at the tips. The lip at the front is a beautiful deep violet, with a large, yellowish callus at the base. The column is purple-blue and boat-shaped. This species flowers during the summer months. It is a native of Colombia, and was introduced in 1878. Syn. *Bollea cœleste.* (B. M., t. 6458.)

Z. crinitum (*Lodd.*).—This scarcely differs from *Z. intermedium* in habit, pseudo-bulbs, and leaves. The flowers are borne on long, stout scapes. The sepals and petals are 2in. long, green, with fewer brown blotches than in *Z. intermedium.* The lip is 2in. across, spreading, wavy, white, with purple lines springing from the crest, radiating towards the margins, and branching vein-like. The principal characters in this species are the shagginess of the lip about the lower part, and the wide leaves. As a free-flowering plant of easy cultivation it is quite the equal of *Z. intermedium,* along with which it requires to be grown. Brazil, 1834. (B. M., t. 3402.)

According to Lindley, there are varieties of *Z. crinitum* with pink, blue, and almost colourless veins in the lip.

Z. Dayanum (*Rchb.*).—This distinct and beautiful species has narrow, keeled leaves, 8in. to 10in. in length, and flowers about 3in. across. The sepals are broadly ovate, and milky-white, tipped with green; the smaller, rounded petals are entirely white. The lip is white, with the ring-shaped callosity in the centre of a beautiful purplish-violet, the rays in front being similarly coloured. The column is mainly yellow, but has a broad, reddish patch at the base. This species flowers in the late autumn; in a wild state it produces as many as twenty-five flowers fully open at one time. It is very variable in colour, and we append some of the varieties of which Prof. Reichenbach has published descriptions, all being of great beauty. The plant was introduced from Colombia in 1873. Syn. *Pescatorea Dayana.*

Var. *candidulum* has the sepals and petals pure white, the lip being tinted with purplish-crimson. A very lovely variety.

Var. *rhodacrum* has white sepals and petals, tipped with purplish-rose, and the lip white, suffused with crimson. The short, broad column is white, crimson at the tip. (B. M., t. 6214.)

Var. *splendens* has the tips of the sepals and petals of a dark violet colour, the lip being also deep violet.

Zygopetalum.

Z. Gautieri (*Lem.*).—This species is very attractive. It differs chiefly from *Z. maxillare* in the flowers being about half as large again; they are also, as a rule, deeper in colour, especially on the fleshy labellum, which in good varieties is a very deep purple-blue, with a still darker-coloured crest. There are also varieties with pale-coloured flowers. The species is a native of Brazil, and was introduced in 1868. It requires the same treatment as *Z. maxillare*. It is not unusual for dealers to call good varieties of *Z. maxillare* by the name of *Z. Gautieri*. (W. O. A., t. 28.)

Z. gramineum (*Rchb. f.*)—This species is singular in not possessing any pseudo-bulbs, the leaves rising in a fan-like manner directly from the root. They are jointed about 1in. from the base, lance-shaped, channelled, 6in. long, and bright green. The flowers are produced in clusters from the bases of the leaves, each on a separate scape, which is about 2in. long and decumbent. In form and colour the flowers are like those of *S. stapelioides*; but the sepals and petals are narrower, and thinly spotted with rich deep brown, whilst the lip is oval, with scarcely any side lobes, the margin crisped, and the colour yellow, shaded with rose and blotched with crimson-brown; the large column is yellow at the top. This plant is not common in cultivation. It has been called *Kefersteinia*, *Maxillaria*, and *Promenæa*. Brazil, 1857.

Z. intermedium (*Lodd.*).—A handsome, free-flowering, easily-grown species, and so like *Z. Mackaii* as to be often mistaken for it. The main difference between the two is that in the latter the lip is glabrous, and the veins are coloured pure blue, whilst in *Z. intermedium* the lip is more or less hairy, and veined with purplish-blue. *Z. crinitum* is another species very similar to these two; indeed, there does not appear to be any good botanic characters to separate them. In *Z. intermedium* the pseudo-bulbs are large and egg-shaped. The leaves are strap-shaped, about 1½ft. long, 1½in. broad, and bright green. The scape is erect, as long as the leaves, and it bears about six flowers, each nearly 3in. across. The sepals and petals are equal, 1½in. long, incurved at the tips, green, with large, confluent blotches of brown. The lip is 1½in. across, wavy, narrowed to a stalk-like base, and coloured bluish-white, with radiating, broken lines of purplish-blue; the disk is fleshy and white; the column is thick, winged, and coloured green and white. The flowers are produced in winter, and last for about two months. Brazil, 1844. (R., ser. 1, t. 16.)

Z. Klabochorum (*Rchb. f.*).—One of the most beautiful of its species. It has the typical strap-shaped, tufted, dark green leaves

of the genus, and they are 1ft. or more in length. Like several other species, it varies considerably in the colouring of its flowers, the form described being that most commonly met with. All the varieties, however, are very ornamental. The flowers measure 3in. to 3½in. across, with the oblong, bluntish sepals and more pointed petals white, the points being of a chocolate-purple. The three-lobed, trowel-shaped lip is usually yellowish (sometimes white), the front portion being almost entirely covered with rows of purple-tipped hairs; the callus at the base is sulphur-coloured, with brown keels. The column is dull yellow, tinged with brown and purple. Ecuador, 1879. Syn. *Pescatorea Klabochorum.* (W. O. A., i., t. 17.)

Var. *ornatissimum* has the tips of the petals a deep mauve-purple, and spots of the same colour at the base. The upper sepal has also a spot at the base.



FIG. 173. FLOWER OF ZYGOPETALUM LEHMANNI (nat. size).

Z. Lalindei (*Rchb. f.*).—A desirable species, somewhat resembling the preceding, but with larger, though less brightly-coloured, flowers. From the base of the broad, nerved, and pointed leaves spring the decurved flower-scapes, each bearing one flower. The sepals and petals are oblong in shape, wavy, and rose-coloured, the lower side of the two lateral sepals being deep rose. The lip is short and yellow, and above it curves the broad, pink column. This species was found in the forests of Colombia in 1873. Syn. *Bollea Patinii.* (G. C., 1875, p. 9, fig. 1.)

Z. Lehmanni (*Rchb. f.*).—An exceedingly handsome species, with leaves from 1ft. to 1½ft. long, and 1in. broad. The flowers

Zygopetalum.

are 3in. to 3½in. in diameter. The sepals and petals are broadly ovate, and white, traversed by close reddish-purple parallel lines. The small lip is of a deep mauve-purple, three-lobed, and very much narrowed at the base, the side lobes being folded towards



FIG. 174. FLOWER-SPIKE OF ZYGOPETALUM MACKAII (much reduced).

the column; the middle lobe is clothed in a remarkable manner with coarse purplish hairs, and the callus, which consists of about a dozen longitudinal ridges, is of a chestnut-brown. Considerable variation in colour appears in different plants; in some, the lines

Zygopetalum.

on the sepals and petals more nearly approach violet, the lip also being violet. Reported to be a native of Ecuador. Syn. *Pescatorea Lehmanni.* (Fig. 173, for which we are indebted to the Editor of the "Gardeners' Chronicle.")

Z. Mackaii (*Hook.*).—The general character of this plant is described under *Z. intermedium.* The flowers are smaller than in *Z. intermedium,* the sepals and petals being pale in colour, the lip smaller and quite glabrous, whilst the radiating, vein-like lines are coloured deep blue; the crest, also, is two-lobed. So far as we can learn, the true *Z. Mackaii* is very rare in cultivation; it is, however, so very similar to the commoner *Z. intermedium* and *Z. crinitum* that, except for botanic collections, the one may do duty for the other—as, indeed, they frequently do. Brazil, 1827. (Fig. 174; B. M., t. 2748.)

Z. maxillare (*Lodd.*).—An old garden favourite, known as the Tree-fern Orchid, from the fact that it is commonly found growing wild upon the stems of tree-ferns, and is often imported with them. We have seen some fine examples of it growing upon living tree-ferns in the Jardin des Plantes, Paris, the effect produced by its richly-coloured flowers against the brown scales of the fern-stem being particularly good. The rhizome is stout, creeping, and bears ovate pseudo-bulbs 2in. long, each with two or three leaves 1ft. long, 1in. broad, with conspicuous nerves. The scape springs from the base of the ripe pseudo-bulb, and is 9in. long, with from six to eight flowers, each 1½in. across; sepals 1in. long; petals the same length, but narrower; they are green, with large blotches of brown. The lip is nearly circular, a little more than 1in. wide, and coloured purplish-blue, the large, ruff-like crest being ½in. deep, and dark purple in colour. This species blossoms in winter, and remains in beauty for about six weeks. It requires intermediate-house treatment, and plenty of water always, and should be planted on a raft or block of fern-stem. Brazil, 1844. (B. M., t. 3686.)

Z. Meleagris (*Lindl.*).—A rather scarce but very handsome and interesting species, with broadly lance-shaped leaves, 1ft. in length, arranged in opposite rows. The peduncles spring from the axils of the leaves, and each bears a solitary flower, 3in. or 4in. across. The sepals and petals are similar in shape, broad at the base, their colour being pale yellow, changing in the upper half to purplish-brown. The lip is about half as large as the petals, and is white at the base and purplish-brown in front; there is a curious crescent-shaped fringe of stiff, yellow hairs in the throat. This species flowers at midsummer, and is a native

Zygopetalum.

of Brazil. Syns. *Huntleya Meleagris* and *Batemannia Meleagris.* (B. R., 1839, t. 14.)

Z. Rollissonii (*Lindl.*).—This has roundish, compressed, green pseudo-bulbs less than 1in. long, and two-leaved. The leaves



FIG. 175. ZYGOPETALUM ROLLISSONII
(nat. size).

are lance-shaped, recurved towards the tips, and from 2in. to 3in. long. The flowers are borne singly on short, decumbent scapes, which spring from the newly-ripened growth, and each flower is 2in. across; the sepals and petals are similar, oblong, with acute points, spreading, and coloured pale, clear yellow;

the lip is three-lobed, the front lobe being the largest and coloured yellow, whilst the side lobes are erect, and spotted and barred with purple. When properly cultivated, this species forms a compact tuft of healthy leaves, and produces annually a very prolific crop of its pretty flowers, which remain fresh on the plant about a month. Brazil about 1838. (Fig. 175, for which we are indebted to the Editor of "The Garden"; B. R., 1838, t. 40.)

Z. rostratum (*Hook.*).—A large-flowered, well-known species, from British Guiana, where it is common on small trees in the shade of forests. It has a creeping rhizome, bearing, at intervals of 1in., ovate, flattened, two-edged pseudo-bulbs 2in. long, at first inclosed in the sheathing portions of the basal leaves. The permanent leaves are 5in. long, 1½in. wide, acute at the apex, dark green. The scapes, which are developed with the new growths, are 4in. long, and bear from one to three flowers, each from 4in. to 6in. across; the sepals and petals are narrow, spreading, white; and the broad, heart-shaped lip is nearly 3in. long, flat, white, with a rose-purple crest and radiating lines of the same colour. The column is short and thick, with a pair of ear-like wings near the apex. This species requires the same treatment as *Z. maxillare*, but a higher temperature, the moist, hot stove being most suitable for it. It flowers in May or June. Introduced about 1830. (B. M., t. 2819.)

Z. stapelioides (*Lindl.*).—A tufted, compact little plant, with dusky-coloured flowers. The pseudo-bulbs are ovate, four-angled, less than 1in. long, bearing one or two lanceolate, glaucous green, striated leaves 3in. to 4in. long, and herbaceous in texture. The scape springs from the base of the matured pseudo-bulb, and is decumbent, 1½in. long, and usually one-flowered; each flower is 1½in. across; the sepals and petals are ovate, spreading, greenish-yellow, with transverse, purple-brown bands, as in *Stapelia bufonia* (whence the specific name). The three-lobed lip is black-purple on the ovate central lobe, paler towards the margin, and streaked the same as the petals; the two horn-like side-lobes are also coloured like the petals, and the column is citron-yellow. Organ Mountains of Brazil, 1830. Syn. *Promenæa stapelioides*. (B. M., t. 3877.)

Z. Wendlandii (*Rchb. f.*).—An attractive plant, with large flowers and bright green leaves, arranged in two fan-like rows, about 8in. long, erect, 1in. across, jointed, with a broad, sheathing base and a pointed apex. The flowers are about 4in. across; sepals and petals nearly equal, oblong, acute, 2in. long, white; lip 2in. long, nearly as wide, recurved towards the apex,

Zygopetalum.

wavy along the margin, white, with the central portion deep purple-blue; the crest is thick, fleshy, crimped, ruff-like, purple in colour; and the short, thick column is white. The blooms appear in September. Native of Costa Rica. Syn. *Warscewiczella Wendlandi.* (W. O. A., t. 126.)

Var. *discolor* has green sepals and petals.

Z. xanthinum (*Rchb. f.*).—A dainty little Orchid, and the best-known of the *Promenæa* section. It is similar to *Z. Rollissoni* in every character except the flowers, which are smaller. The sepals and petals are pale lemon-yellow, and the column is streaked with red; the lip is three-lobed, yellow, with crimson spots in the throat. Brazil, 1838. Syns. *Promenæa citrina* and *P. xanthina.*

GARDEN HYBRIDS.

Clayi	*crinitum* and *maxillare* (Clay).
crinito-maxillare	*crinitum* and *maxillare* (Rothschild).
leucochilum	*Mackaii* and *Burkei* (Veitch).
pentachromum	Syn. *Sedenii.*
Perrenoudii	*intermedium* and *Gautieri* (Peeters).
Sedenii	*Mackaii* and *maxillare* (Veitch).

BRITISH AND OTHER HARDY ORCHIDS.

THERE are a considerable number of prettily-flowered and highly interesting terrestrial Orchids which may be grown in the open air in this country. Besides those native species which are worth notice for the quaintness of form and fantastic colours of their flowers, a great many terrestrial kinds from North America and from the European Continent are available for open-air gardening, and when the conditions are suitable they are capable of producing a beautiful display. Such are the Cypripediums, the Fringe, Bee, and Butterfly Orchises. These plants, however, attract comparatively little notice from English Orchid fanciers, and they are consequently not much grown. Most of those mentioned here may be procured at little cost from the few English nurserymen who pay

attention to these plants. An Illustration showing the comparative sizes and shapes of some of the British species will be found at page 17.

The failures that attend the first attempt to grow a collection of hardy species in an ordinary garden are often trying enough to dishearten anyone not possessed of a good stock of perseverance. The plants are, as a rule, very impatient of removal, and generally too little care is taken by collectors to preserve the fleshy roots and tubers intact and unbruised. To attempt to establish roughly-treated plants of most of these Orchids is labour in vain. This fact accounts for the belief that they are hopeless as garden plants. On the other hand, a few growers have met with much success in their cultivation. When well grown there is no more delightful picture than tufts or large groups of such plants as *Cypripedium spectabile*, *Orchis foliosa*, and its two allies *O. latifolia* and *O. maculata*. Then there are the *Ophrys*, almost every one of which is possessed of some charm in the form and markings of the flowers.

There are three methods which have proved successful in the cultivation of hardy Orchids: these are the bed or rockery method, the frame method, and that of pot culture.

Bed or Rockery Treatment.—A bed for these plants should be so situated as to be shaded from the sun, except in the morning or evening. The shade of shrubs or trees, or, failing these, that of a wall with a south-east or south-west aspect, will answer. The soil should be taken out to a depth of about 2ft., and replaced by 6in. of good drainage, brick-rubble being the best material for this purpose. Over this a layer of tough turfs should be placed. The soil must necessarily vary with the needs of the plants for which it is intended. If a representative collection is to be planted in the bed, then a portion of it should be filled with a mixture of sweet black peat (such as is used for Heaths), leaf-mould, and coarse sand; this will accommodate those plants to which loam and lime are distasteful. Another portion should be filled with a mixture of peat, loam, and leaf-mould in equal parts, and the remainder with good light turfy loam, mixed with old mortar from buildings, or with chalk.

British and other Hardy Orchids.

When planting, the tubers and roots should be buried about 2in. below the surface. The roots should be handled gently and spread out, slightly pressing the soil about them. In dry weather the border must be kept well watered; the water for those species which are not in loam should be soft or rain water. A mulching of moss or cocoa-nut fibre should be placed on the bed in hot weather. These conditions may be slightly modified if the plants are to be grown amongst stones in the rockery. In the case of the hardy Cypripediums we find that if they are planted amongst hardy Ferns they do best. It is therefore desirable to have a bed made for these so that the Lastreas and other ferns may be provided for: the roots of the Ferns keeping the soil porous and open, they do not suffer so much from wet in winter. The dead fronds also should be allowed to remain to protect the Orchids from frost in winter. Fig. 176 represents a batch of these plants near the pond in Mrs. Cookson's garden at Oakwood.

Should the weather in winter be very wet and the temperature changeable, a covering of boards or lights, or even dead leaves, will protect the plants from harm. It is not the cold but the alternations of mild with cold weather, fogs, and rain, that destroy these plants when left unprotected in an English garden.

Frame Culture.—The frame is used by some in preference to the open border, as it is much easier to regulate the moisture and temperature by means of movable lights. Except in winter the plants are left exposed to the air and weather. For such as the *Ophrys*, which require a good ripening in the autumn by means of drought and sunlight, the lights are a great advantage. In other respects the treatment of plants in frames should be similar to that recommended for those in open beds.

Pot Culture.—Where it is desirable to remove the plants when in flower to a conservatory or a room, they may be grown in pots: these should vary in size according to the nature of the plants, such strong-rooting kinds as *Cypripedium* and *Orchis foliosa* requiring a liberal amount of root-room, whilst the *Ophrys*, *Serapias*, and others, which have not much root, require considerably less room. It is best to put about five plants of these smaller kinds



FIG. 176. HARDY CYPRIPEDIUMS GROWING AMONG FERNS IN THE ROCK GARDEN, OAKWOOD.

in a 6in. or an 8in. pot. The pots should be well drained. The soil used for plants in pots should be specially good.

Collecting.—The right season for collecting terrestrial Orchids is after the flowers are over and the leaves have begun to fade. The tubers should be kept in damp moss until they can be planted.

ARETHUSA.

A. bulbosa (*L.*).—A swamp-loving plant from North America, and a pretty little Orchid for a fissure in a rockery. Its one-leaved stem is about 8in. high, and it bears a large, solitary, rosy-purple, scented flower, which develops in July.

CALOPOGON.

C. pulchellus (*R. Br.*) is from the same country, and thrives under the same conditions, as the *Arethusa*. It is pretty in flower, but difficult to establish here. It will be found described in the body of the work.

CYPRIPEDIUM.

For generic description the reader is referred to the body of the work (p. 142).

C. acaule (*Ait.*).—This large-flowered, distinct species, has a pair of broad, ovate leaves 4in. long, folded at the base, and pubescent. Scape erect, 6in. to 9in. high, leafless, with a green bract at the top, one-flowered. Sepals and petals narrow, 1½in. long, slightly twisted, whitish; pouch ovate, nearly 2in. long, irregularly slit from the base to the apex; colour deep rose, with darker reticulating lines. This species should be grown in peat, or peat and leaf-mould, in a shady position. It thrives under Rhododendrons if kept well watered in dry weather. It also thrives when grown in pots, and is useful for forcing. A native of North America, where it grows in woods. (Fig. 177.)

C. arietinum (*R. Br.*).—Of the hardy kinds, this is the smallest-flowered. Its stem is about 6in. high, and bears four leaves, which are lanceolate and nearly smooth. Flower-segments ½in. long, reddish, with white veins; pouch as long as the segments, and of the same colour. The pouch is conical and deflexed at the apex, a character to which the popular

British and other Hardy Orchids.

name of Ram's-head Orchis is due. This species inhabits swamps and damp woods in North America and West China. It thrives here in bog-peat, or in good sandy leaf-mould, and flowers in June. Introduced in 1808. (B. M., t. 1569.)

C. Calceolus (*L.*).—Interesting as being the largest-flowered amongst British Orchids; it is also an ornamental and useful garden plant. Stems 1ft. to 1½ft. high, with about four large, ovate, pointed leaves, and one or two flowers. The latter have dark brown, wavy sepals and petals, 1½in. long, the dorsal sepal the broadest; pouch 1in. long, clear yellow, the

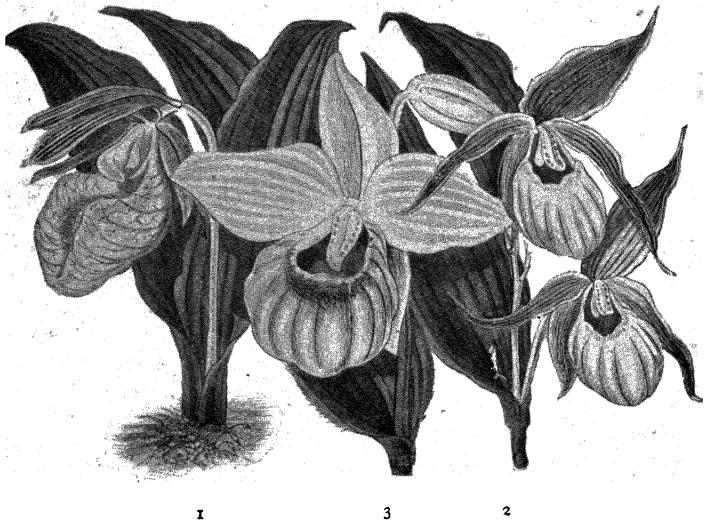


FIG. 177. CYPRIPEDIUM (1) ACAULE, (2) CALCEOLUS, (3) SPECTABILE (much reduced).

end rounded and curved upwards. This species blossoms in May or June. It should be planted 6in. deep, in good, light, fibrous loam, in a deep fissure of the rockery, or in a border where it will get shade from bright sunshine. It may also be cultivated in pots or pans, in a mixture of loam and peat. When happily situated it increases rapidly, and we have seen patches of it a yard square, bearing over fifty flower-spikes. Besides its British habitat, this species is also found in Northern Europe and Asia down to the Himalayas. (Figs. 177 and 178.)

Var. *major* has flowers 4in. across.

British and other Hardy Orchids.

C. candidum (*Muhl.*).—This is almost as small-flowered as *C. arietinum*. Its stem is about 1ft. high, and bears several erect, lanceolate, pubescent leaves, 4in. long. Flowers solitary, 1½in. across; sepals and petals 1in. long, green and brown; pouch about the size of a robin's egg, laterally compressed, pure white, with a few spots of purple about the mouth. It blossoms in June, requiring boggy peat and plenty of moisture. It is not a showy species. A native of North America, whence it was introduced in 1826. (B. M., t. 5855.)

C. guttatum (*Sw.*).—An interesting, pretty-flowered species, not often met with in gardens. It is about 9in. high, the short stem bearing two leaves, which are ovate, pointed, decumbent, and downy. Scapes 6in. long, hairy; dorsal sepal broadly ovate, ¾in. long; petals the same length, but much narrower and decurved; pouch the size of a pigeon's egg, with a large aperture; colour of the whole flower white, with large blotches of rich crimson. The blossoms are developed in summer. Collectors describe the conditions under which this species grows when wild as being "half-shaded positions in woods, in soil composed of half-rotten leaves, usually under birch-trees. Here it grows freely like lily-of-the-valley, its rhizomes being only just buried." It should be grown in leaf-mould, in a moist, shaded position on the rockery. A native of Canada and the northern parts of Europe and Asia. (P. F. G., i., t. 183.)



FIG. 178. CYPRIPEDIUM CALCEOLUS (much reduced).

C. irapeanum (*Llav.* and *Lex*).—This rare and beautiful species may be called a gigantic *C. pubescens*. The stems are leafy, slender, 1½ft. high. The leaves are ovate, pointed, stem-clasping at the base, and pale green. The flowers are 5in. across; the sepals are ovate, 2in. long, a little smaller than the petals, both being pubescent and bright yellow. The pouch

is of the same colour, but a little darker, with a few blotches of crimson in the mouth; it is fully 2in. across at the base. The great beauty of this plant has induced many collectors to send home quantities of it for cultivation, but it has never yet been successfully grown. It is said to be almost, if not quite, hardy. A native of Mexico, near a town called Irapeo, where it grows at an elevation of 5000ft.; introduced and flowered in 1846. The treatment recommended for *C. pubescens* is said to be the most satisfactory of the many methods tried for this Mexican gem. (B. R., t. 58.)

C. japonicum (*Thunb.*).—A truly wonderful plant, of which comparatively little is known here. From a mass of roots and creeping rhizomes a pair of leaves are developed, much in the same way as in *C. acaule*, but larger, plicate, almost fan-shaped, and 4in. across. The scape is 1ft. high, leafless, and hairy; it bears one large flower, in which the ovate-lanceolate sepals and petals are 2½in. long, greenish, with crimson spots at the base of the latter. The lip is gigantic, being 2½in. long by 1½in. wide, and white, marbled with pink; the aperture extends two-thirds of the way down, as in *C. acaule*. *C. japonicum* was known only from Japanese descriptions and drawings until it was imported from Japan by Messrs. Wallace, of Colchester, who succeeded in flowering it in 1875. It is said to grow in abundance in moist woods in Japan. The plant which flowered at Colchester was planted in light loam in a pot, and grown in a cold fernery. Some recommend pure peat for it, but, so far as we know, the loam treatment is the only one that has resulted in flowers. (G. C., 1875, iii., p. 624.)

C. macranthum (*Sw.*).—This very remarkable species, in the form and colour of its large flowers, may be characterised as almost grotesque. The stems are 1ft. or more high, pubescent, with ovate, striated, green leaves, 5in. long, hairy only about the base. The flowers are borne singly on the apex of the stems, and they have broad, ovate sepals 1½in. long, petals a little shorter and narrower, and the pouch large, projecting, inflated at the base, nearly 3in. long, and coloured salmon-red, mottled and veined with a darker shade, almost white at the mouth. This plant is difficult to manage under cultivation, having been known to flower only a few times in England, although many people have grown it. Loam appears to agree with it best. Messrs. Backhouse flowered it by planting it in a fissure of the rockery in strong rich soil. It is a native of Siberia, in latitude 58deg., where it grows in open places or in birch woods. (Fig. 179, for which we are indebted to the Editor of "The Garden.")

British and other Hardy Orchids.

C. montanum (*Dougl.*).—This has stems 1½ft. high, with ovate-lanceolate, slightly hairy leaves. Each stem bears from one to three flowers, which have brown-purple sepals and petals, a white lip striped with red inside, and a yellow staminode also spotted with red. It is a native of California. Syn. *C. occidentale.* (B. M., t. 7319.)

C. occidentale (*S. Watson*).—A synonym of *C. montanum.*

C. parviflorum (*Salisb.*).—Closely allied to the British *C. calceolus.* Its stems are 1ft. or more high; the leaves are ovate, slightly downy, 5in. long. The flowers are large and deliciously fragrant; sepals ovate-lanceolate, 1½in. long; petals narrower, a little longer, twisted; both purple-brown with darker-coloured lines. Pouch large, ovate, 1½in. long, bright yellow, with a few dots of crimson about the mouth. This species is easily cultivated in England; it should be planted in sandy leaf-mould or loam, and be kept moist all the summer and shaded in bright weather. It may be grown successfully in pots along with such species as *C. spectabile.* It is found wild in swamps and damp woods in North America, whence it was introduced over 100 years ago. (B. M., t. 3024.)



FIG. 179. FLOWER OF CYPRIPEDIUM MACRANTHUM (½ nat. size).

C. pubescens (*Willd.*).—For the rock-garden or herbaceous border this is a useful plant. It grows to a height of 2ft., and has leaves 8in. long by 2in. wide, tapering to both ends and covered with soft hairs. The flowers are large; sepals 2½in.

long and ¾in. wide; petals 4in. long, narrow and twisted; both yellow with a few blotches of brown and a few hairs at the



FIG. 180. CYPRIPEDIUM SPECTABILE
(much reduced).

base of the petals. Pouch 2in. long, ovate, irregular in shape, folded over at the mouth, flattened at the sides, coloured pale yellow. This species flowers in June. It should be planted in

light loam or leaf-mould, although it is said to grow naturally on stiff clay in woods. North America, 1790. (B. M., t. 911.)

C. spectabile (*Sw.*).—Of all the hardy Cypripediums, this is the handsomest and most useful. When happily situated, it produces stems between 2ft. and 3ft. in height, bearing lanceolate, plicate leaves about 7in. long, acute-pointed and hairy. The flowers are borne singly or in pairs, and are each 3in. across; sepals almost round, 1½in. long, concave; petals ½in. wide, 2in. long; pouch almost orbicular, broadest at the base, where it measures about 1½in. across; staminode large, ovate, white. The colour of the sepals and petals is white, of the pouch some shade of rose, the best varieties being a clear red; others have wholly white flowers. This grand species inhabits peat bogs in North America, where it appears to be very abundant, and is known as the Moccasin Flower. When planted in a moist border of deep peat, it grows well and flowers annually. It also thrives when planted in pots, placed in a cold, shaded frame, plunged in cocoa-nut fibre or ashes, and kept moist. In March it may be taken into a slightly heated greenhouse, where it will soon push into growth and flower. It should never be allowed to get dry. Introduced in 1731. (Figs. 177 and 180.)

HABENARIA.

There are about one hundred species of this genus, but very few of them are of any value as garden plants. Of the three which are natives of this country, only one, viz., *H. bifolia*, has any beauty. Several species from North America, also, are sometimes seen in English collections, but they are not common. The plants have two tubers, leaves and habit as in *Orchis*, and loose-flowered spikes of long-spurred, often fringed-lipped, flowers.

Culture.—The British species requires the same treatment as *Orchis*, but the American kinds must be treated as bog-plants, and grown in a shaded situation in peat, or peat and chopped sphagnum or leaf-mould.

H. bifolia (*R. Br.*).—The British Butterfly Orchid. It grows to a height of about 1ft., and has two or three ovate leaves; from the centre of these springs the erect, leafy spike of white flowers, each 1in. across, and very fragrant. It is abundant in open woods and moist meadows, which are redolent with the fragrance of its flowers in June or July.

British and other Hardy Orchids.

H. blephariglottis (*Poir.*).—From the same country as *H. ciliaris*, and differs from it chiefly in having white flowers. It is a decidedly pretty plant when well grown.

H. ciliaris (*R. Br.*).—This, the Yellow-Fringed Orchis of North America, is described under *Habenaria* in the body of the work (p. 261).

H. fimbriata (*R. Br.*).—The Purple-Fringed Orchis of North America. It has a stem 2ft. high, bearing a loose head of purplish flowers, each over 1in. broad, with a large fan-shaped lip deeply fringed about the margin. When happily treated, this species produces, in June, spikes of from thirty to fifty flowers, which last for about three weeks.

OPHRYS.

There are about thirty kinds of *Ophrys* described, three of them being natives of Britain, and familiarly known as the Bee, the Spider, and the Fly Orchis. They all closely resemble each other in the characters of their tubers, leaves, and flower-stem, and in the form of their flowers, the only marked difference being in the shape and colour of the segments and lip. The tubers are ovoid; the leaves are green, oblong, acute, and arranged in a rosette about 6in. across. The flower-spike varies in height from 6in. to 18in., and it bears from three to six flowers; these are about 1in. across, and the only conspicuous part is the lip, which is usually convex, velvety, and beautifully coloured. The resemblance of these flowers to various insects is due to the arrangement of the colours of the lip, as well as its form. The colours vary considerably in the different individuals of the same kind, a character which led Linnæus to believe that all the *Ophrys* were probably forms of one very variable species.

Whilst every one of the thirty admitted species of *Ophrys* is worth growing, some of them are not easily accommodated in the garden, and others are difficult to procure. We have selected a few of the best.

Culture.—The most successful cultivator of these plants in England was the Comte de Paris, who, at one time, exhibited many beautiful specimens at the London plant exhibitions. If planted in pots they should be plunged in ashes or cocoa-nut fibre during the growing season. Good

fibrous loam, with sharp sand and a little pounded chalk, should be used. In this the tubers must be buried 1in. below the surface, and the soil pressed moderately firmly about them; 6in. pots are the most convenient, and into



FIG. 181. OPHRYS TENTHREDINIFERA
(much reduced).

each about five plants should be placed. They may also be grown in a fissure of the rockery.

O. apifera (*Huds.*) (Bee Orchis) is common in this country in chalk or limestone districts. We have seen thousands of plants

in small areas about Dorking in flower in June. The stems are about 1ft. high, and bear from three to six flowers, in which the lip is the most conspicuous part, being ovate, convex, velvety brown-purple, spotted with orange-yellow.

O. aranifera (*Huds.*) (Spider Orchis) has a broad, dull-brown lip, spotted with yellow, and **O. muscifera** (the Fly Orchis), with a three-lobed, almost flat lip, coloured bright brown-purple, with a blue patch and sometimes a yellow edge, are also British kinds which differ from the Bee Orchis only in the characters here mentioned.

O. insectifera (*Linn.*).—A continental plant that Linnæus took as the type of all the *Ophrys*. It has a stem 8in. high, the rosette of leaves measuring 5in. across. There are about six flowers on each spike, and they are 1in. across; the sepals are green, the petals white, and the lip is velvety-purple, with two streaks of grey-blue.

O. tenthredinifera (*Tenore*).—This, the Sawfly Orchis, is a native of the European continent. It is a strong grower, with spikes 9in. high, greenish-brown sepals and petals, and a velvety brown and yellow lip. (Fig. 181, for which we are indebted to the Editor of the "Gardeners' Chronicle.")

The following are all more or less known in English collections, but they are not often grown with success; they are abundant in Italy, France, &c., and are imported in quantity by dealers in this class of plants: **O. Bertolonii** (*Moretti*), with brown-purple lip; **O. bombylifera** (*Willd.*); **O. exaltata** (*Tenore*); **O. lutea** (*Cav.*), with green sepals and petals, and a golden-yellow lip, maroon-purple in the centre, with an eye-like patch of steel-blue; and **O. speculum,** in which the sepals and petals are banded with purple, and the lip is peacock-blue, with a golden iris and purple margin.

ORCHIS.

Some of the Orchises are very pretty in flower, and they are easy to manage in the garden. They require a rich loamy soil, a sheltered situation either in a border or in the rock-garden, plenty of water, and an annual mulching with rotten manure. The British species here mentioned are abundant in moist meadows in most parts

of the British Islands, so that a good stock of them may easily be obtained. In transferring them from their wild homes to the garden, they must be carefully taken up so as not to injure the feeding roots and new tubers. The right time to remove them is after the flowers have faded, say September, when the new tuber will have about matured; the wrong time to attempt this is when the plants are in full flower and the tuber is only partly formed. If collectors would bear this in mind, we should not see so many thousands of these plants sacrificed in attempts to transfer them from fields to cultivation. The genus was founded by Linnæus.

O. foliosa (*Soland.*). — A robust species, from Madeira, allied to *O. latifolia*, and hardy in England. Its stems are about 3ft. high, with shining green ovate leaves, 10in. by 3in., a spike 7in. long by 3in. through, crowded with bright purple, or lilac, or sometimes almost white flowers. Planted in deep fibrous loam and protected from slugs, it makes a very showy border or rockery plant. It blooms in July or August. It is also a good pot-plant, and by keeping it in a cool frame until about February, and then removing it into a warm greenhouse, it may be had in flower in April.



FIG. 182. ORCHIS LATIFOLIA (much reduced).

O. latifolia (*L.*).—Common in marshes and moist meadows in this country. It varies considerably in height, width of the leaves, and size and colour of the flowers. The best forms are fully 1ft. high, with the flower-spike as represented in the accompanying illustration, and coloured deep purple. It differs from *O. maculata* only in having unspotted leaves and

a less distinctly-lobed labellum. (Fig. 182, for which we are indebted to the Editor of "The Garden.")

O. laxiflora (*Lam.*).—This is a European species which does not occur in the British Islands, except in Jersey and Guernsey. Its leaves are unspotted, its stems are from 1ft. to 3ft. high, and its flowers 1in. across, bright red-purple, the lip being spotted with a darker colour. It blooms in May or June, and is easily kept if planted in a moist situation in a loamy soil.

O. maculata (*L.*).—An easily-managed British species, often met with in gardens. It has narrow, spotted leaves, and an erect spike 1ft. or so high, bearing a compact pyramid of pale purple or white and spotted flowers, which are at their best in June or July. It thrives in a moist, loamy soil, in a slightly shaded position. It is one of the commonest of field Orchids, and may be easily transferred to the garden.

O. pyramidalis (*L.*).—One of the prettiest when seen in the mass, its compact spikes of bright rosy flowers being very effective. It is common in Britain in pastures, flowering in midsummer. It is easy to cultivate if planted in an open loamy soil with a little chalk added. The tubers should be planted about 3in. apart, and in the mass to produce a fine effect.

O. spectabilis (*L.*).—A showy species from North America, with oblong, green leaves, and stems about 1ft. high, bearing pink-purple flowers, with an ovate, undivided lip. It grows in a mixture of peat and leaf-mould, in a moist, shaded position, flowering in May.

Other pretty species are: **O. longibracteata** (*Biv.*), **O. Munbyana** (*Boiss.*), **O. papilionacea** (*L.*), **O. purpurea** (*Huds.*), and **O. sambucina** (*L.*).

SERAPIAS.

There are four species of *Serapias*, natives of the countries bordering the Mediterranean, where they occur in pine woods, &c. They are like *Orchis* in habit, but the flowers differ in having the three upper sepals united and forming a hood, out of which the labellum hangs, tongue-like, and is the most conspicuous part of the flower. The petals are small, and are enclosed in the hood formed by the sepals. Two of the species merit a place in the garden, their flowers being large and attractive.

British and other Hardy Orchids.

Culture.—Both species flower about May. They should be planted in a well-drained bed, or in pots, in a light loam, and be kept wet whilst in growth, and dry when at rest.

***S.* cordigera** (*L.*).—This has narrow, green leaves, mottled with purple at the base. The spike is from 8in. to 12in. high, and about six-flowered. The sepals are lilac, streaked with red, and the lip is pendulous, flat, 1in. long, and coloured rich purple-brown. (B. M., t. 5868A.)

S. lingua (*L.*).—In habit and stature identical with *S. cordigera*, but the leaves are wholly green, and the flowers are slightly smaller, the lip being crimson, narrower, and less pendulous than in that species. (B. M., t. 5868B.)

We have selected for description in this chapter only such hardy kinds as are popularly known as pretty in flower; but there are many others, both British and foreign, which are possessed of characters of interest for those cultivators whose pleasure in plants does not stop at size and colour beauty. The singular forms and highly specialised structure that characterise almost every one of the British species form the subject of one of Charles Darwin's most delightful works, namely, "The Fertilization of Orchids," a book that everyone interested in Orchids should read.



A CHAPTER FOR BEGINNERS.

INSTEAD of the chapter on "Selections for Beginners" we have thought it more in accordance with the plan of the present Edition of this work to replace the selections of varieties, &c., by a few hints that may be of service to the beginner. An endeavour has been made in some of the preceding pages to show that Orchid cultivation is not what it is generally understood to be—a hobby only to be indulged in by those endowed with plenty of this world's goods. Here we repeat that numbers of Orchids (including many of the finest and best species, varieties, and hybrids) are within the reach of the enthusiastic amateur, and may be procured quite as cheaply as the stove, greenhouse, or half-hardy plants that one finds so skilfully and well cultivated by some of the amateurs in suburban gardens, and even in the vicinity of large towns and manufacturing districts. Here also we would again impress upon our readers that there are no greater difficulties experienced in the cultivation of Orchids than there are in the successful cultivation of other plants. It is not until this is fully realized that Orchids will appeal to that wider circle that it is our desire to reach.

The first thing to be considered is the house in which it is proposed to grow the plants. First of all arises the question: What temperature can be commanded during the severe winter months? Having satisfied one's self, it will be easy to ascertain from the earlier pages of this work where there is accommodation suitable for stove, intermediate, or cool-house plants. It will be necessary to consider the aspect of the house, and to judge to some extent as to the amount of light obtainable. While on this subject we would allude to some of the errors commonly made by uninitiated amateurs who, in their enthusiasm, are easily induced to erect glass structures in most unsuitable positions, often attached

to the dwelling house. This means that it is the first step to render the dwelling unhealthy if the requirements of plants are to be supplied, and therefore the attachment of greenhouses to dwelling-houses cannot be too severely condemned.

Having ascertained the heating advantages, and the position, it is useless to expect to grow Orchids that require an abundance of strong light in a house with a north aspect, where for the greater part of the year there is little sun. Far better is it, even with plenty of heating power, to turn such a structure into a cool-house, and grow only species and varieties that do not require a great amount of bright light. The desire by amateurs to grow Orchids may generally be traced to their having attended an Orchid sale or to having seen some plants successfully cultivated by a neighbour. Naturally the beginner is attracted by the showiest species and varieties, quite unmindful of their cultural requirements, and the limited means that they possess for their accommodation. We have frequently seen the amateur secure such attractive plants as *Cattleya labiata*, simply because such plants were being sold for less money than their flowers would realise in the basket of a flower-seller in the streets. Such purchases are very well while the flowers last, but in attempting to cultivate the plants under unfavourable circumstances, the ardour of the grower gets damped, and he not infrequently deduces therefrom that he is not likely to become a successful cultivator of Orchids.

Were the question asked: What are the most suitable Orchids for beginners? we should have no hesitation in recommending the Slipper Orchids or Cypripediums, if an intermediate temperature house were at command. There are sufficient species, varieties, and hybrids amongst these to supply a succession of bloom throughout the whole year. Even in the depth of winter, when other flowers are scarce, they produce the greater proportion of their blossoms, and these last for months in perfection. As so large a proportion of this work has already been devoted to Cypripediums, space will not permit of our further dealing with the genera here. We therefore refer readers to page 142 for particulars as to cultivation and the selection of varieties.

A Chapter for Beginners.

There are many other Orchids requiring intermediate-house culture that may be successfully cultivated under similar conditions to Cypripediums—cool-house Orchids such as the popular *Odontoglossum crispum* and its varieties, *O. Pescatorei*, *O. triumphans*, *O. Hallii*, *O. Edwardii*, *O. luteo-purpureum*, *O. nebulosum*, *O. Rossii majus*, *O. Andersonianum*, and other natural hybrid Odontoglossums; *Oncidium concolor*, *O. tigrinum*, *O. macranthum*, *O. superbiens* and its allied kinds, and *O. ornithorhynchum; Masdevallia Harryana* in its endless colour form, *M. ignea*, *M. Veitchii*, and *M. Davisii;* the whole of the Restrepias; *Sophronitis grandiflora;* and *Epidendrum vitellinum majus.* The whole of these may be procured cheaply and possess good constitutions, and no difficulty should be experienced in their successful culture, if the particulars given for cultivation under their respective genera are followed. The warmer kinds, such as *Aërides*, *Phalænopsis*, *Vanda*, *Dendrobium*, *Calanthe*, *Phaius*, and the showy and attractive *Cattleya* and *Lælia*, are not the most suitable subjects, even if a stove is available, for the beginner to commence with. Although generally, and with but few exceptions, they are easy to cultivate, some special knowledge of their needs is desirable before satisfactory cultivation can be assured. Even those who have spent their lives in the cultivation of Orchids frequently find a difficulty with some one or other of the warm-house kinds—doubtless oftener from inability to procure suitable conditions than to want of attention and cultural skill.

It must always be remembered that in our glass-houses the conditions provided are wholly artificial. In some cases these artificial conditions are appreciated by the plants—a fact abundantly indicated by the more robust constitution and increased size of foliage, compared with what obtains in imported plants, while the normally one-flowered species and varieties sometimes become twin-flowered. In the case of Cattleyas and Lælias, there are a great number of experienced Orchid cultivators who fail utterly to retain these Orchids in anything approaching their normal state of vigour. On the other hand, the hybrids of these, which have been raised and cultivated wholly under artificial conditions, are induced to grow satisfactorily for an indefinite period. We instance these facts not with

a view to discouraging the beginner, but rather so to guide him that he may avoid possible disappointments. Orchid-growers, whether they are growing for "trade purposes" in nurseries where Orchids are made a special feature, or in charge of the collections of wealthy and prominent amateurs, are always willing to lend their aid and advice as to what would be the most suitable kinds to procure. The Horticultural Press is always willing to help those who ask its assistance; so that advice on any material point can be procured without any great difficulty. We trust that the few hints and particulars referred to may tend to remove some of the erroneous impressions with regard to Orchid culture that have been formed, and at the same time lead to a more general cultivation of these interesting and lovely plants by amateur gardeners.

INDEX.

Generic names, and those of bigeneric hybrids, are printed in SMALL CAPITALS, and synonyms in *italics*.

A.

ACACALLIS, Lindl., 33
 cyanea, Lindl., 33
ACAMPE, Lindl., 33
ACANTHOPHIPPIUM, Blume, 34
ACINETA, Lindl., 34
 Barkeri, Lindl., 35
 culture, 34
 densa, Lindl., 35
 glauca, Lindl., 35, 295
 Humboldtii, Lindl., 35
 Warscewiczii, Klotzsch., 34
 Wrightii, 269
ACERAS, R. Br., 17
 anthropophora, R. Br., 17
ACRIOPSIS, Reinw., 35
 javanica, Reinw., 35
Acropera, Lindl., 253
 armeniaca, Lindl., 254
 Loddigesii, Lindl., 254
ADA, Lindl., 36
 aurantiaca, Lindl., 36
 Lehmanni, Rolfe, 37
AEONIA, Lindl., 37
 polystachya, Benth., 37
AËRANTHES, Lindl., 37
 grandiflorus, Lindl., 37
AËRANTHUS, Rchb. f., 37
 Curnowianus, Rchb. f., 38
 Leonis, Rchb. f., 50
AËRIDES, Lour., 38
 affine, Wall., 43
 crassifolium, Rchb. f., 40
 crispum, Lindl., 40
 c. Lindleyanum, Wight, 41
AËRIDES—*contd.*
 crispum Warneri, 41
 culture, 39
 Emericii, Rchb. f., 41
 expansum, Rchb. f., 41
 falcatum, Lindl., 41
 Fieldingii, Lindl., 42
 F. album, 42
 Huttoni, Hort., 449
 japonicum, Rchb. f., 43
 Lawrenceæ, Rchb. f., 43
 L. Sanderianum, Rchb. f. 43
 Lobbii, Lem., 43
 maculosum, Lindl., 43
 m. Schrœderi, 43
 mitratum, Rchb. f., 43
 multiflorum, Roxb., 43
 odoratum, Lour., 38, 44
 o. majus, 44
 o. purpurascens, 44
 quinquevulnerum, Lindl., 44
 radicosum, A. Rich., 44
 Rohanianum, Rchb. f., 45
 roseum, Lodd., 43
 rubrum, Hort., 44
 Sanderianum, Rchb. f., 43
 suavissimum, Lindl., 44
 tæniale, Lindl., 39
 Vandarum, Rchb. f., 45
 virens, Lindl., 45
 v. Dayanum, 45
 Warneri, Hort., 41
Aërobion, Kæmpf., 46
AGANISIA, Lindl., 46
 cærulea, Rchb. f., 33, 46
 cyanea, Rchb. f., 33, 46

AGANISIA—*contd.*
ionoptera, Nichols., 46
lepida, Lindl., 46
Ainia, Lindl., 45
Ait Flower, 38
All Saints' Flower, 274
AMBLOSTOMA, Scheidw., 46
cernuum, Scheidw., 46
trichactylum, Rchb. f., 46
ANGRÆCUM, Thou., 46
articulatum, Rchb. f., 48
bilobum, Lindl., 48
caudatum, Lindl., 48
Chailluanum, Hook., 49
citratum, Rchb. f., 50
culture, 48
eburneum, Thou., 50
e. virens, 50
Ellisii, Rchb. f., 50
falcatum, Lindl., 50
fastuosum, Rchb., 50
funale, Lindl., 231
Humblotii, Rchb. f., 50
hybrid, 51
modestum, Hook., 50
Sanderianum, Rchb. f., 51
Scottianum, Rchb. f., 51
sesquipedale, Thou, 51
ANGULOA, Ruiz and Pav., 51
Clowesii, Lindl., 52
culture, 52
eburnea, Hort., 52
Ruckeri, Lindl., 52
R. sanguinea, 52
uniflora, Ruiz and Pav., 52
virginalis, Hort., 53
ANŒCTOCHILUS, Blume, 53, 300
argenteus, Hort., 54, 431
concinnus, Hort., 54
culture, 53
Dawsonianus, Low, 54, 262
Frederici-Augusti, Hort., 56
Lowii, Hort., 240
Petolus, Hort., 301
regalis, Blume, 54
r. cordatum, 54
Reinwardtii, Blume, 54
Rollissoni, Hort., 254
Roxburghii, Lindl., 55
Sanderianus, Kranzl., 55, 300
setaceus, Blume, 54
striatus, Hort., 55, 508
xanthophyllus, Planch., 55
ANSELLIA, Lindl., 56
africana, Lindl., 56
africana, 57
a. nilotica, Baker, 57
confusa, N. E. Br., 57
ANSELLIA—*contd.*
congoensis, Rodigas, 57
culture, 56
gigantea, Rchb. f., 57
humilis, Hort., 57
h. pallida, 57
nilotica, N. E. Br., 57
Aphides, 10
APPENDICULA, Blume, 57
bifaria, Lindl., 57
callosa, Blume, 57
monoceras, Rchb. f., 57
Peyeriana, Blume, 57
ARACHNANTHE, Blume, 57
bella, Rchb. f., 58
Cathcartii, Benth., 16, 58
Clarkei, Rolfe, 59
Lowii, Benth., 60
moschifera, Blume, 60
ARETHUSA, Gronov., 523
bulbosa, L., 523
Argyrorchis javanica, Blume, 60, 300
ARPOPHYLLUM, Llav. and Lex, 60
giganteum, Lindl., 61
ARUNDINA, Blume, 61
bambusæfolia, Lindl., 61
ASPASIA, Lindl., 61
lunata, Lindl., 62
odorata, Hort., 62
principissa, Rchb. f, 62

B.

Barkeria, Kn. and Westc., 242
elegans, Kn. and Westc., 243
Lindleyana, Batem., 245
Skinneri, Paxt., 246
BARTHOLINA, R. Br., 62
pectinata, R. Br., 62
BATEMANNIA, Lindl., 63
Burtii, Endr. and Rchb. f., 510
Colleyi, Lindl., 63
lepida, Rchb. f., 63
Meleagris, Rchb. f., 516
Bed treatment of hardy Orchids, 519
Bee Orchis, 17, 518, 531
Beginners, advice to, 536
help for, 539
mistakes of, 536, 537
selections for, 537
BIFRENARIA, Lindl., 63
atropurpurea, Lindl., 63
aurantiaca, Lindl., 64
Charlesworthii, Rolfe, 64
Hadweni, Lindl., 455
Harrisoniæ, Rchb. f., 64
inodora, Lindl., 64

Black Spot, 5
BLETIA, Ruiz and Pav., 64
acuminata, Rchb. f., 65, 281
culture, 64
Gebina, Lindl., 65
Godseffiana, Kranzl., 65, 66
hyacinthina, R. Br., 65
patula, Hook., 65
Perrinii, Rchb. f., 64, 280
Shepherdii, Hook., 66
Sherrattiana, Batem, 66
verecunda, R. Br., 66
v. Godseffiana, 65, 66
Woodfordii, Hook, 418
Blinds, 4
Bollea, Rchb. f., 509
cœlestis, Rchb. f., 511
BONATEA, Willd., 66
speciosa, Willd., 66
Botanical features, 15
Bothriochilus bellus, Lem., 118
BRASSAVOLA, R. Br., 67
acaulis, Lindl. and Paxt., 67
cucullata, R. Br., 67
cuspidata, Hook., 67
Digbyana, Lindl., 276
elegans, Hook., 486
lineata, Hook., 67
venosa, Lindl., 67
BRASSIA, R. Br., 67
antherotes, Rchb. f., 68
brachiata, Lindl., 68
Gireoudiana, Rchb. f., 68
Lanceana, Lindl., 68
L. macrostachya, 69
L. pumila, 69
Lawrenceana, Lindl., 69
L. longissima, Rchb. f., 70
maculata, R. Br., 70
m. guttata, 70
verrucosa, Lindl., 70
v. grandiflora, 71
Wrayæ, Hook., 70
BRASSO-CATTLEYA, 71
BRASSO-CATT.-LÆLIA, 71
British Orchids, 17, 19, 518 (*See* Hardy Orchids)
BROMHEADIA, Lindl., 71
palustris, Lindl., 71
BROUGHTONIA, R. Br., 71
sanguinea, R. Br., 72
BROWNLEEA, Harv., 72
cærulea, Harv., 72
BULBOPHYLLUM, Thou., 72
anceps, Rolfe, 74
barbigerum, Lindl., 74
Beccarii, Rchb. f., 74
calamarium, Lindl., 74
BULBOPHYLLUM—*contd.*
culture, 73
Dayanum, Rchb. f., 74
Dearei, Rchb. f., 74
grandiflorum, Blume, 75
lemniscatum, Parish, 75
Lobbii, Lindl., 75
L. siamense, 75
White's, Mr. W. H., paper on, 73
Burlingtonia, Lindl., 444
candida, Lindl., 445
decora, Lem., 445
fragrans, Lindl., 446
venusta, Lindl., 446
Butterfly Orchid, 403
Orchid, British, 529
Orchis, 518
Buying plants, 4

C.

CALADENIA, R. Br., 75
Patersoni, R. Br., 76
P. dilatata, 76
CALANTHE, R. Br., 76
bicolor, Lindl, 79
culture, 77
hybrids, 80
Masuca, Lindl., 78
Sieboldii, Maxim., 79
striata, R. Br., 79
veratrifolia, R. Br., 79
vestita, Wall., 79
v. Fournieri, 80
v. gigantea, 80
v. nivalis, 80
v. porphyrea, 80
v. Regnierii, 80
v. rubro-oculata, 80
v. Turnerii, 80
CALOPOGON, R. Br., 81, 523
pulchellus, R. Br., 81, 523
CALYPSO, Salisb., 82
borealis, Salisb., 82
CAMARIDIUM, Lindl., 82
Lawrenceanum, Hort., 82
ochroleucum, Lindl., 82
CATASETUM, Rich., 83
barbatum, Lindl., 84
Bungerothii, N. E. Br., 83
Christyanum, Rchb. f., 84
culture, 83
Garnettianum, Rolfe, 84
longifolium, Lindl, 84
macrocarpum, Rich., 84
pileatum, Rchb. f., 84
Randii, Rolfe, 85

CATASETUM—*contd.*
saccatum, Lindl., 85
Scurra, Rchb. f., 85
tridentatum, Hook., 84
CATTLEYA, Lindl., 85
Aclandiæ, Lindl., 88
Alexandræ, L. Lindl., 92
amethystina, Morr., 95
amethystoglossa, Rchb. f., 93
aurantiaca, P. N. Don, 242
aurea; Lindl., 91
bicolor, Lindl., 90
Bowringiana, Veitch, 90
bulbosa, Lindl., 105
chocoënsis, André, 90
citrina, Lindl., 90
crispa, Lindl., 276
culture, 87
dolosa, Rchb. f., 91
Dormaniana, Rchb. f., 277
Dowiana, Batem, 91
D. aurea, T. Moore, 91
Eldorado, Lindl., 92
E. Wallisii, 92
elongata, Rodr., 92
Fly, 10, 13
Forbesii, Lindl., 92
garden hybrids, 97
Gaskelliana, Sander, 92
gigas, Lind. and André, 107
granulosa, Lindl., 92
g. asperata, 93
g. Schofieldiana, 93
guttata, Lindl., 93
g. Leopoldi, 93
g. Prinzii, 93
g. Russelliana, 93
g. Sanderiana, 93
Harrisoniæ, 94
Harrisoniana, Batem., 94
H. candida, 94
H. maculata, 94
H. violacea, 94
house for, 88
hybrids, 107
imperialis, Hort., 107
intermedia, R. Grah., 95
i. alba, 96
labiata, Lindl., 96
l. alba, 96
l. albescens, 96
l. Cooksoniæ, 96
l. R. I. Measures, 96
l. vera, 96
Lawrenceana, Rchb. f., 96
Leopoldi, Versch., 93
lobata, Lindl., 275
Loddigesii, Lindl., 99
CATTLEYA—*contd.*
Luddemanniana, Rchb. f., 99
L. alba, 99
L. brilliantissima, 99
L. Regina, 99
L. Schrœderi, 99
marginata, Paxt, 280
maxima, Lindl., 100
m. alba, 100
m. aphlebia, 100
m., Backhouse's var., 101
Mendellii, Backh., 101
M. Bluntii, 101
M. Leeana, 101
M. Morganæ, 101
Mossiæ, Hook., 101
M. autumnalis, Hort., 99
M. candida, 102
M. Hardyana, 102
M. Reineckiana, 102
M. Wageneriana, 102
natural hybrids, 110
Percivaliana, Rchb. f., 103
pest, 10, 13
Pinellii, Lindl., 280
quadricolor, Batem., 105
Regnelli, Warn., 103
Rex, O'Brien, 103
Schilleriana, Rchb., 103
Schofieldiana, Rchb. f., 93
Schrœderæ, Sander, 103
Skinneri, Batem. 104
S. alba, 104
S. oculata, 104
S. parviflora, 104
speciosissima Lowii, Hort., 99
superba, Schomb., 104
Trianæi, Rchb. f., 105
T. alba, 105
T. Schrœderæ, 103
Veitch on, 85
velutina, Rchb. f., 105
Volxem, Van, on, 86
Walkeriana, Gardn., 105
W. nobilior, 105
W. Schrœderiana, 105
Warnerii, T. Moore, 105
Warscewiczii, Rchb. f., 106
watering, 87
CEPHALANTHERA, Rich., 111
Cheapness of Orchids, 2, 536
Chichilitic Tepetlavhxochitl, 279
CHONDRORHYNCHA, Lindl., 111
Chestertoni, Rchb. f., 111
CHRYSOGLOSSUM, Blume, 112
villosum, Blume, 112
CHYSIS, Lindl., 112
aurea, Lindl., 113

CHYSIS—*contd.*
bractescens, Lindl., 113
Bruennowiana, Rchb. f., 113
culture, 112
hybrids, 113
Limminghei, Rchb. f., 113
Oweniana, Hort., 113
CHYTROGLOSSA, Rchb., 113
CIRRHÆA, Lindl., 114
saccata, Lindl., 114
viridi-purpurea, Bot. Mag., 114
CIRRHOPETALUM, Lindl., 114
Collettii, Hemsl., 116
Cumingii, Lindl., 115
graveolens, 115
picturatum, Lodd., 115
pulchrum, N. E. Br., 115
robustum, Rolfe, 115
Rothschildianum, Hort., 116
Thouarsii, Lindl., 117
CLEISOSTOMA, Blume, 117
ringens, Rchb. f., 117
COCHLIODA, Lindl., 117
Noezliana, Rolfe, 118
vulcanica, Benth., 118
v. grandiflora, 118
Cockroaches, 10, 13
CŒLIA, Lindl., 118
bella, Rchb. f., 118
CŒLIOPSIS, Rchb. f., 118
hyacinthosma, Rchb. f., 119
CŒLOGYNE, Lindl., 119
asperata, Lindl., 120
barbata, Griff., 121
corrugata, Lindl., 121
corymbosa, Lindl., 121
cristata, Lindl., 121
c. alba, 122
c. Chatsworthi, 123
c. Lemoniana, 123
c. maxima, 123
cultuie, 119
Dayana, Rchb. f., 123
elata, Lindl., 123
flaccida, Lindl., 123
fuscescens, Lindl., 123
f. brunnea, 123
Gardneriana, Lindl., 124
graminifolia, Par. and Rchb. f., 124
hololeuca, Hort., 122
Lowii, Paxt., 121
Massangeana, Rchb. f., 124
ocellata, Lindl., 124
odoratissima, Lindl., 125
pandurata, Lindl., 125
Parishii, Hook., 126
Sanderiana, Rchb. f., 126
speciosa, Lindl., 126
CŒLOGYNE—*contd.*
Swaniana, Rolfe, 127
tomentosa, Lindl., 127
Veitchii, Rolfe, 127
COLAX, Lindl., 127
culture, 127
Harrisoniæ, Lindl., 64
jugosus, Lindl., 127
COLLABIUM, Blume, 128
nebulosum, Blume, 128
simplex, Rchb. f., 128
Collecting, 7
hardy Orchids, 523
Colours of flowers, 19
Column, the, 18
COMPARETTIA, Pœpp., 128
falcata, Pœpp. and Endl., 129
macroplectron, Rchb. f., 129
Cookson, Mr. Norman, Calanthe hybrids obtained by, 32
Cool-house temperatures, 7
CORYANTHES, Hook., 129
Bungerothii, N. E. Br., 84
culture, 129
macrantha, Hook., 130
maculata, Hook., 131
m. punctata, 131
speciosa, Hook., 131
CORYCIUM, Sw., 131
CORYMBIS, Thou., 131
Cost of plants, 2, 536
COTTONIA, Wight, 132
Championi, Lindl., 233
macrostachya, Wight, 132
peduncularis, Lindl., 132
Cowhorn Orchid, 454
Cradle Orchid, 51
Cross-fertilization, 21-32 (*See* Hybridisation)
CRYPTARRHENA, R. Br., 132
CRYPTOCHILUS, Wall., 132
CRYPTOPHORANTHUS, Rolfe, 133
atropurpureus, Rolfe, 133
Dayanus, Rolfe, 133
gracilentus, Rolfe, 133
maculatus, Rolfe, 134
Culture, general, 8
of British and other hardy Orchids, 518
Cut-flower market, culture for, 1
CYCNOCHES, Lindl., 134
aureum, Lindl. and Paxt., 134
chlorochilon, Klotzsch, 135
culture, 134
ventricosum, Batem., 136
Warscewiczii, Rchb. f., 136
CYMBIDIUM, Sw., 136
culture, 137